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REPORT DOCUMENTATION PAGE

1. REPORT DATE (DD-MM-YYYY) 01-06-1998	2. REPORT TYPE Thesis	3. DATES COVERED (FROM - TO) xx-xx-1998 to xx-xx-1998
4. TITLE AND SUBTITLE Facing the Future: A Doctrine for Air Control in Limited Conflicts Unclassified		5a. CONTRACT NUMBER
		5b. GRANT NUMBER
		5c. PROGRAM ELEMENT NUMBER
6. AUTHOR(S) Walker, Richard F. ;		5d. PROJECT NUMBER
		5e. TASK NUMBER
		5f. WORK UNIT NUMBER
7. PERFORMING ORGANIZATION NAME AND ADDRESS School of Advanced Air Power Studies Air University Maxwell AFB , AL 32116		8. PERFORMING ORGANIZATION REPORT NUMBER
9. SPONSORING/MONITORING AGENCY NAME AND ADDRESS ,		10. SPONSOR/MONITOR'S ACRONYM(S)
		11. SPONSOR/MONITOR'S REPORT NUMBER(S)
12. DISTRIBUTION/AVAILABILITY STATEMENT A PUBLIC RELEASE ,		

13. SUPPLEMENTARY NOTES**14. ABSTRACT**

Since the fall of the Soviet Union and the end of the Cold War, the United States has found itself involved in an increasing number of small scale interventions in support of national objectives, humanitarian efforts, and United Nation resolutions. Interventions have been manpower intensive and have increased the burden on our military forces. The dilemma the US finds itself in today is similar to the problem faced by Great Britain as she tried to maintain control of her empire after World War I. The solution developed by the British was the concept of "Air Control," intended to minimize both the number of ground troops required to maintain order in the colonies, and their associated expense. Airpower would not replace the ground units, but it would significantly reduce the required forces by increasing the mobility and firepower support available to ground garrisons.

15. SUBJECT TERMS

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT Public Release	18. NUMBER OF PAGES 77	19a. NAME OF RESPONSIBLE PERSON Fenster, Lynn lfenster@dtic.mil
a. REPORT Unclassified	b. ABSTRACT Unclassified	c. THIS PAGE Unclassified			19b. TELEPHONE NUMBER International Area Code Area Code Telephone Number 703 767-9007 DSN 427-9007

Facing the Future:
A Doctrine for Air Control in Limited Conflicts

By
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A THESIS PRESENTED TO THE FACULTY OF THE SCHOOL OF
ADVANCED AIRPOWER STUDIES FOR COMPLETION OF
GRADUATION REQUIREMENTS

SCHOOL OF ADVANCED AIRPOWER STUDIES
AIR UNIVERSITY
MAXWELL AIR FORCE BASE, ALABAMA
JUNE 1998

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Abstract

Since the fall of the Soviet Union and the end of the Cold War, the United States has found itself involved in an increasing number of small scale interventions in support of national objectives, humanitarian efforts, and United Nation resolutions. Interventions have been manpower intensive and have increased the burden on our military forces. The dilemma the US finds itself in today is similar to the problem faced by Great Britain as she tried to maintain control of her empire after World War I. The solution developed by the British was the concept of “Air Control,” intended to minimize both the number of ground troops required to maintain order in the colonies, and their associated expense. Airpower would not replace the ground units, but it would significantly reduce the required forces by increasing the mobility and firepower support available to ground garrisons.

As the United States takes on increasing numbers of operations around the world, it too has increasingly shifted toward a policy of using airpower to maintain control while minimizing the footprint and cost of the operation. Unfortunately, this shift has been accomplished without a guiding doctrine for air control in limited conflicts. The trial and error approach to building efficient concepts of operations has proven costly in the human lives lost through inappropriate or delayed actions. Air planners must be able to translate political policies into valid, appropriate ROE which can protect the forces involved and the people of the region while still achieving the political objectives. This paper proposes a doctrine for the use of air control in these limited, low intensity conflicts.

By first analyzing the British experiences at air control in the 1920s and 30s, then studying the concepts of operations in Operations Provide Comfort in Iraq and Deny Flight in Bosnia, this study draws lessons for the proper use of airpower in air control. These lessons are then used to build a comprehensive doctrine for air control in low intensity conflicts with limited political objectives.

Limited conflicts that call for air control are becoming increasingly common and more complex. Air strategists must develop and refine air control doctrine to stay ahead of this trend, rather than continuing to try to build ad hoc arrangements and “figure it out as we go.”

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Chapter 1

Introduction

Since the fall of the Soviet Union and the end of the Cold War, the United States has found itself involved in an increasing number of small scale interventions in support of national objectives, humanitarian efforts, and United Nation resolutions. Recent interventions have included operations in Iraq, Bosnia, Haiti, Rwanda, and Somalia to name a few. All of these interventions have been manpower intensive and have increased the burden on our military forces and makes the ability to win Major Regional Conflicts (MRC's) much more problematic.

The dilemma the US finds itself in today is similar to the problem faced by Great Britain as she tried to maintain control of her empire after World War I. The solution developed by the British was the concept of "Air Control," intended to minimize both the number of ground troops required to maintain order in the colonies, and their associated expense. Airpower would not replace the ground units, but it would significantly reduce the required forces by increasing the mobility and firepower support available to ground garrisons.

As the United States has taken on increasing numbers of operations around the world, it too has increasingly shifted toward a policy of using airpower to maintain control while minimizing the footprint and cost of the operation. Ongoing operations in Iraq and Bosnia have slowly shifted their emphasis away from ground forces and toward airpower. Unfortunately, this shift has been accomplished without a guiding doctrine for air control in limited conflicts. The trial and error approach to building efficient concepts of operations has proven costly in the human lives lost through inappropriate or delayed actions. To competently make the shift toward greater reliance on airpower in regional,

limited conflicts, the Air Force must develop a comprehensive doctrine for the use of air control.

Building a comprehensive doctrine first requires a working definition of what air control is and what it is intended to accomplish. Once this definition is developed, past experiences in air control should be examined and used as a guide to understand which concepts might be valid for our own time. These experiences can provide a foundation for an effective doctrine of air control.

Air Force Doctrine Document 1, (AFDD-1), states “Air and space doctrine is a statement of officially sanctioned beliefs and warfighting principles that describe and guide the proper use of air and space forces in military operations.”¹ This doctrine concept is then broken down in to basic, operational, and tactical doctrine. “Basic doctrine states the most fundamental and enduring beliefs that describe and guide the proper use of air and space forces in military action. . .Operational doctrine, contained in AFDD 2-series publications, describes more detailed organization of air and space forces and applies the principles of basic military doctrine to military actions. Operational doctrine *guides the proper employment of air and space forces in the context of distinct objectives, force capabilities, broad functional areas, and operational environments.* . . . Tactical doctrine describes the proper employment of specific weapon systems individually or in concert with other weapon systems to accomplish detailed objectives.”² The basic doctrine document, AFDD-1, briefly lists the operations it refers to as Military Operations Other Than War (MOOTW). The operations in this list which are most appropriate for air control are Enforcement of Sanctions, Enforcing Exclusion Zones, Nation Assistance (in the form of Foreign Internal Defense, FID, and Peace Operations). In its operational doctrine document, AFDD 2-3, Military Operations Other Than War, the doctrine center gives a brief definition of each of these MOOTW operations, but it fails to specify any operational details or doctrine for dealing with them.³ Most of the other Air Force operational (Two-level) doctrine documents introduce the concept of operations in a general volume, then use subordinate volumes to describe the doctrine in

¹ AFDD-1, “Air Force Basic Doctrine”, September 1997, pg. 1.

² Ibid, 2.

³ AFDD 2-3, “Military Operations Other Than War”, 5 October 1996.

detail. The MOOTW volume, AFDD 2-3, however, has no subordinate volumes to expand the concepts it introduces and defines. The Air Force Doctrine Center says that in the future these concepts will be expanded in AFDD 2-3-x volumes, but the effort has not yet begun.⁴ Nevertheless, the number of current worldwide operations dealing with operations other than war demands that the issue be addressed now. This study will attempt to fill this hole in operational doctrine.

First, what exactly is meant by the term “air control?” The British Air Ministry Air Staff Memorandum No. 46, written in 1930, stated “The term ‘air control’ implies that control is applied by aircraft as the primary arm, usually supplemented by forces on the ground, which may be armored vehicles, regular or irregular troops, armed police or tribal forces – according to particular requirements.”⁵ This definition was based on two decades of trial and error in the application of airpower for the control of outlying colonies, including British Somaliland, Iraq, Palestine, and Aden. Although this definition is a good starting point, it fails to specify the appropriate conditions for implementation, and what goals and objectives are attainable and realistic for the application of air control.

I would propose a modern definition of air control: Air Control is a strategy of controlling the behavior of a state, nation, or group, using predominantly airpower, in situations involving limited political objectives. It is most appropriate in low level conflicts which require a rapid, economical means of response to accomplish limited political goals, where the objectives do not require the full commitment of the nation’s military power. Usually there are no vital national interests at stake and political support is not sufficient for the large scale introduction of ground troops.

What separates air control from other types of air campaigns is that the main goal is diplomacy, not destruction. The mission of air control is more one of a constabulary force, meant to prevent a difficult situation from getting out of control, than that of an occupational force. By stabilizing the situation, air control prevents large scale operations by the opposing forces, while giving diplomacy and sanctions time to operate.

⁴ Interview with Maj Scott Walker, AF Doctrine Center, Maxwell AFB, AL, 1 May 1998.

⁵ Air Staff Memorandum No. 46, *Notes On Air Control of Undeveloped Countries*, London: Air Ministry, 1930

Participants are therefore coerced into taking specific actions or refraining from taking other actions without the requirement for large ground occupational forces. Methods for coercion by air control include: threatening to destroy high value assets; Denying the use of high value assets; and conducting punitive strikes to punish for violations of sanctions. Success depends on clear technical and force superiority over the target group, excellent intelligence of target intentions and activities, and limited, realistic, political objectives.

Air control can involve any or all of the functions of airpower, both lethal and non-lethal. It may use anything from violent attacks to punish negative behavior, to the airdrop of humanitarian supplies to reinforce positive behavior. This modern definition of air control involves many of the same principles and methods as traditional air campaigns, but is usually applied to a more politically constrained environment. With a working definition of air control, we must draw from experience, both historic and contemporary, to build a data base of lessons learned, from which to develop our doctrine.

The British were the pioneers at replacing expensive ground troops with airpower, and exploiting the speed and mobility of aircraft to help them to maintain control of their colonies. British air control experiences in British Somaliland, Palestine, Mesopotamia, and Aden during the 1920s and 30s provide some useful lessons. Despite limitations in the doctrine highlighted in Palestine, methods of air control begun in British Somaliland right after World War I and refined in Mesopotamia in the 1920s, proved useful in the 1930s in Aden. Although many of the methods for control used by the British would be politically inappropriate today and, although the technology has changed dramatically, some of the principles developed in those early years remain applicable to our own day.

Contemporary air control operations in Iraq and Bosnia provide some lessons on the limitations of air power and its ability to operate in support of peace operations. Operation Provide Comfort in Iraq and Deny Flight/Deliberate Force in Bosnia have so far been conducted mainly on an ad hoc basis, being modified only as a result of trial and error. By studying the successes and failures of more recent operations, one can gain insights into the kinds of modern political considerations that apply when enforcing UN sanctions and conducting peace operations.

Finally, after reviewing past successes and failures, a doctrine for air control can be proposed. The doctrine set out in the concluding chapters is necessarily broad. While it cannot cover every conceivable situation, it will hopefully ensure that the right questions are asked and that a careful analysis will be conducted in order to avoid some of the mistakes of the past. This doctrine proposal will address a basic concept for operations, requirements for self defense and defense of others, and considerations for offensive operations.

The scope of this study is intentionally limited to small scale, highly political, and limited conflicts. Because of the dominance of US conventional firepower demonstrated in the Gulf War, most opponents are not likely to directly challenge US forces on the battlefield in conventional, state to state confrontations. The likely future scenarios for the US Air Force will include limited conflicts and support of UN resolutions. Although it is vital that the Air Force be prepared for major regional conflicts, the doctrinal gap at the operational level dealing with low intensity conflicts also needs to be addressed. Successful conduct of peace operations depends on a sound doctrine that is based on solid experience, in order to build air control plans which effectively exploit the synergistic effects offered by modern airpower.

Chapter 2

The Origins of Air Control: Using The RAF To Police The British Empire

At the close of World War I, Great Britain set about the difficult task of reasserting control over her Empire. With so much of Britain's strength tied up on the European Continent during the war, it had been impossible for her to properly manage the colonies and newly acquired mandate territories. Rebels and local factions took advantage of Britain's preoccupation with the war, and tried to challenge British control.

With the acquisition of the mandated territories from the defeated German and Ottoman Empires, the Empire reached its greatest extent at a time when Britain was weakened by war and was facing a period of rapid economic decline. It was thus essential to find and successfully utilize a cheaper means of maintaining the 'imperial peace.'⁶

Winston Churchill and RAF Chief of Staff Hugh Trenchard believed they had a better solution, air control, and they were willing to put their theory to the test in British Somaliland, Palestine, Mesopotamia (Iraq), and the Aden Protectorate.

Using the Royal Air Force to assume much of the responsibility for policing the empire promised tremendous savings if successful. What the RAF was proposing was a new concept called "air control." Air Ministry Air Staff Memorandum No. 46 stated "The term 'air control' implies that control is applied by aircraft as the primary arm, usually supplemented by forces on the ground, which may be armored vehicles, regular or irregular troops, armed police or tribal forces – according to particular requirements."⁷

⁶ MacKenzie, John M., "General Introduction," in Omissi, David E., *Air Power and Colonial Control, The Royal Air Force 1919-1939*, Manchester, Manchester University Press, 1990 viii.

⁷ Air Staff Memorandum No. 46, *Notes On Air Control of Undeveloped Countries*, London: Air Ministry, 1930.

This idea was considered radical at the time and most government officials and military leaders did not believe it could be accomplished.

Winston Churchill was one of the strongest advocates for air control. As Minister of War and Air, he “confronted the House in December 1919 with his characteristic boldness on the subject. ‘Odd as it may seem,’ he said, ‘on the morrow of unheard-of victories, we have all those dependencies and possessions in our hands which existed before the war, and in addition, we have large promises of new responsibilities to be placed upon us. The first duty of the Royal Air Force is to garrison the British Empire.’”⁸

Air Chief Marshal Sir Hugh Trenchard supported Churchill’s strategy, and he saw the air control mission as a way to save the independent Royal Air Force. “Trenchard, under pressure from the Army and the Royal Navy for the disbandment of the RAF, was pleased to propose a scheme which not only gave his service a more prominent role but also attracted an additional £5 million to his budget.”⁹

The main opponent of air control and an independent RAF in general was Chief of the Imperial General Staff Sir Henry Wilson. He said, “I do not believe in Winston’s ardent hopes of being able to govern Mesopotamia with hot air, aeroplanes and Arabs.”¹⁰ Wilson “was anxious to reduce the world-wide British military commitments, and . . . believed that even the present position in Mesopotamia could not be maintained without more troops. Wilson’s hostility to the air control scheme was bound up with his desire to see the independent air force abolished. As he confided in his diary on 7 May: ‘The sooner the Air Force crashes the better. . .it is a wicked waste of money as run at present.’”¹¹

The first test for air control came in British Somaliland. “From the 1890’s a troublesome sect of Dervishes under Mohammed bin Abdulla Hassan led armed resistance to British occupation. The ‘Mad Mullah’ ruthlessly bound the various warring tribes in the interior into a very effective force which declared a *jihad* against the British

⁸ Sims, Charles, *The Royal Air Force, The First Fifty Years*, W&J Makay & Co LTD, UK, 1968 37.

⁹ Canavan, Michael B. M., “The Royal Air Force and Air Control to 1939”, Montgomery, University of Alabama paper, 1993 8.

¹⁰ Henry Wilson to Henry Rawlinson, 12 July 1921, *The Wilson Letters*, in Omissi, 18.

¹¹ Omissi, 22.

in British Somaliland.”¹² To accomplish the task of vanquishing Hassan without using the RAF, “Sir Henry Wilson, thinking along the lines of colonial expeditions of the past, estimated that it would take most of twelve months and two divisions at least to do the job. To ensure that the situation remained stable thereafter would mean an additional expenditure running into millions of pounds to build railways, roads, and garrison bases.”¹³

After almost six months of debate on the issue, Trenchard was able to arrange for a force of twelve RAF bombers to be sent from Cairo to Somaliland. “The operations which began on 21 January 1920 can be divided into two distinct phases: the first, which lasted only five days, consisted largely of independent air action, while during the second, more than three weeks long, aircraft were used to support the military units of the Protectorate. The opening raids surprised the Dervish troops who were immediately scattered, defeated and pursued into the hinterland.”¹⁴ The Mad Mullah fled, his followers dispersed, and law and order were restored... The total cost was something in the nature of £77,000. ‘The cheapest war in history’, a famous politician wrote later in his memoirs.”¹⁵

Far from settling the air control debate, this single operation against a rebellious tribe in a small, backward region, only spurred more intense debate as each side interpreted the results in their own interest. “John Salmond [air power advocate and later AOC for air control in Iraq] argued that the actions of the ground troops were ‘invaluable’ but ‘subsidiary’ to the bombing campaign, which he considered a fine example of the use of air power in colonial warfare. His views were supported by the Governor of the Protectorate who believed that the credit for the overthrow of the Mullah was ‘primarily due to the Royal Air Force, who were the main instrument of the attack and the decisive factor. . .The War Office and its supporters, however, saw the campaign in a different light and emphasized the limitations of air power. Henry Rawlinson (the Commander-in-Chief, India) pointed out that independent air action had lasted just a few days and considered that only the sustained pursuit of the Mullah’s forces by imperial

¹² Canavan, 5.

¹³ Sims, 38.

¹⁴ Omissi, 15.

ground troops caused the disintegration of Dervish resistance. Some army officers even suggested that the presence of aeroplanes had hampered the chances of an imperial success.”¹⁶ The viability of air control remained unproved, and was put to the test again almost immediately in Iraq and Palestine.

The situation in Iraq in 1920 was very unstable, with several groups competing for control. After the Ottomans withdrew from the region, the League of Nations mandated control to the British in 1920. Uprisings began as the Kurdish population attempted to gain its independence under the charismatic leadership of Sheikh Mahmud. Strongly supported by the Turks, Mahmud was repeatedly able to make control difficult for the British as they tried to set up a legitimate Iraqi government. At the same time, in the southern region of Iraq, incessant raids from the Ikhwan tribes in Saudi Arabia were devastating the Bedouin population west of the Tigris and Euphrates rivers. In 1920, there were approximately 25,000 British and 80,000 Indian troops in Iraq attempting to maintain order. Although the British could not afford to continue this method of control at a cost of over £23 million per year, surrendering their interest in this area was also out of the question. Iraq’s strategic location and natural resources, such as oil, had to be protected. “A secure route to India was still a central concern of imperial strategy: an air and land bridge across the Middle East offered a useful alternative to the main links by sea. . . As the Royal Navy gradually converted from coal-burning to oil-burning ships, it became more and more difficult to obtain supplies of high quality fuel. Dependence upon the production of the United States and Mexico was a strategic embarrassment which might best be averted by the development of Mesopotamian reserves.”¹⁷

“The General Staff believed Basra and the Anglo-Persian oil fields could be held by one division for £8 million per year. This, however, would mean the destruction of the Mandate; the end of all hopes of a friendly Arab government; the loss of northern Persia, Mosul and Baghdad; and perhaps the occupation of those areas by the Turks or the Bolsheviks.”¹⁸ To prevent the loss of this critical colony, the Cairo Conference of 1921 recommended a reduction in troop strength to 4000 British and 10,000 Indian troops,

¹⁵ Sims, 38-39.

¹⁶ Omissi, 15.

¹⁷ Omissi, 20.

working with ten squadrons of aircraft. The actual force committed in Iraq “amounted to eight RAF squadrons, four infantry battalions, three companies of armored cars manned by the RAF, and support units.”¹⁹

The overall strategy for control depended on the inherent speed and mobility of aircraft to replace the large, plodding columns of troops normally sent out to control insurrections. The central aspects to this strategy were intelligence gathering, quick reaction, and a clear concept of operations which emphasized the political nature of the activity.

One of the most critical men in the gathering of intelligence for the British was RAF Captain John B. Glubb. Early on, Glubb recognized that the cross-questioning of travelers coupled with random patrols was an inadequate approach to intelligence gathering. He escorted ground patrols and flew with air patrols to learn the characteristics of the desert and create the first accurate maps of the area. Glubb found that the hard crust of the Iraqi desert sand would support the weight of armored vehicles and the light aircraft of the day, so he pressed for the formation of quick reaction forces to track down raiders who attacked the Bedouin tribes. As a result of his experiences escorting the patrols, however, Glubb found that the vastness of the Iraqi and Arabian deserts made it impossible for the few aircraft and armored cars at the RAF’s disposal to locate even large groups of Ikhwan raiders. By the time the survivors of a raid reached the nearest British outpost to report the attack, the trail was cold and the raiders had escaped across the southern border.

Glubb then took a radical step. He decided to live with the Bedouins in the desert to gain their trust and learn why they were so vulnerable. He discovered that the traditional Arab hospitality which demanded that they take in any traveler to feed them and shelter them for the night, was allowing raiders to learn their location. Ikhwan spies would pose as travelers looking for shelter, then slip away in the night to give the location of the Bedouin camp to the raiders, who then ambushed the tribe at first light. Glubb decided to try the same strategy in reverse. “It seemed to me that all that was now necessary was to organize spies, similar to those used by the Ikhwan, to sit in their camps

¹⁸ Ibid , 24.

¹⁹ Canavan, 10.

and slip away at night and report to us, as soon as a raid set out. I accordingly set myself to organize such an espionage service.”²⁰ The intelligence information Glubb gained in this manner allowed him to take advantage of superior British firepower with armored cars and aircraft support to set up ambushes for the raiders. The technique worked and the Ikhwan raiders were eventually defeated. Glubb was able to use an effective human intelligence network to focus the British speed and mobility at the critical points needed to overcome the illusive raiders.

Air Marshall Sir John M. Salmond, the Air Officer Commanding (AOC) of all military forces in Iraq from 1922-24, emphasized the importance of a quick reaction to any uprising or disturbance. In Air Staff Memorandum No. 16 he said, “There can be no two opinions at all that air action rapidly taken at the focus of trouble, and before it has chance to spread, and discriminating in its incidence, is in every way a less severe and yet a more powerful corrective than the visit of a column of troops to a then extended area of trouble, with its inevitable accompaniment of destruction and tribal retaliation, and casualties to both sides and long-remaining misery in the area visited.”²¹ The speed and mobility of air power made air control ideal for delivering the quick reaction required to police the remote regions of the colonies.

The concept of operations for air control in Iraq was unavoidably political in nature. By the 1920’s, the British Parliament had clearly weighed in on the side of using minimum force to maintain control of the colonies. This put a limit on how air power and its massive firepower advantage could be utilized. “There was an underlying tension between the political need to use the minimum necessary force, to avoid lasting resentments, and the desire of some air force officers, trained to think in terms of military ‘solutions’ to use the maximum violence at their disposal.”²² The ability of aircraft to attack villages with relative safety, while devastating the villagers below, led many to believe that a punishment strategy would be the most efficient method of air control. “Some air officers at first claimed that excessive initial violence would produce a ‘moral

²⁰ Glubb, Sir John Bagot, *War in the Desert, an RAF Frontier Campaign*, London: Hodder and Staughton, 1960, 231.

²¹ Air Staff Memorandum No. 16, *Principles Governing The Use Of Air Power In Iraq*, London: Air Ministry, 1924

²² Omissi, 159.

effect' so great that further dissidence would not occur."²³ But the political reality would not accept such a brutal policy.

The maximum violence strategy of colonial control had recently been attempted by ground troops in India in the Amritsar region. "A crowd of about 5000 assembled in the Jallianwalla Bagh – a piece of waste ground – on the afternoon of 13 April 1919. With no specific warning, a party of infantry opened fire on the hostile but unarmed gathering. Firing continued for ten minutes; almost every bullet found a mark in the dense mass; and about 1,500 people were killed or wounded. General Dyer, who commanded the troops, later said that he intended his action to produce a 'moral effect' not only on the Amritsar crowd, but throughout the Punjab...[As a result] Imperial policing fluctuated uncertainly between excessive force, which might antagonize neutrals and cause lasting bitterness, and a show of weakness, which might encourage the undecided to stay friendly with the rebels."²⁴ Winston Churchill, one of air control's strongest supporters, made his opinion on the use of excessive force clear after the Amritsar incident. "In one of his finest speeches Churchill asked the House to weigh Macaulay's expressive horror at 'the most frightful of all spectacles, the strength of civilization without the mercy.' He hoped that frank terrorism would never be acknowledged a principle of imperial policing, noted that British power in India had never rested on force alone, and pragmatically warned that the rule of naked violence 'would be fatal' to the Empire."²⁵

Recognizing the political sensitivities involved, Henry Dobbs, the High Commissioner for Iraq said, "A situation may frequently arise in which the capture or killing of a specified offender or offenders would have a good political effect, while the indiscriminate bombing of non-combatants associated with such offender or offenders would have a bad effect. The Air Force are unable to select and identify with precision the persons who are to be the objects of their attack or to effect a capture...I must, therefore, reserve to myself the right to decide in times of peace whether the political situation is such that the bombing of any particular place or tract of country from the air

²³ Ibid, 181.

²⁴ Omissi 150-151

²⁵ Ibid, 151.

is desirable.”²⁶ In response to this policy, Air Marshall Sir John Salmond developed the following standard procedures for dealing with the Iraqi people. “If a local political officer or the police reported a disorder that was beyond their control, the offenders would be summoned to appear for trial in a court of law. If they refused, or continued their criminal activities, a warning would be dropped telling them that unless they submitted, their village would be bombed and subsequently blockaded by air until the required submission was forthcoming. An aircraft would duly appear over the now-deserted village on the stated date and bomb it, and in the days that followed further light attacks would be made, possibly with delayed-action bombs scattered around the area of the village. Almost without fail, this method produced a submission within a short time; the villagers, already living at the poverty level, could not afford to have their routine interrupted for long. Once the offenders had surrendered, a small force of police or troops, supported by medical personnel, would be flown in to restore order, tend to the sick and wounded and help restore the bombed village to habitable standard.”²⁷ The following two examples taken from Salmond’s official Iraq Command Report in 1923 illustrate this concept in action in Iraq:

In April, a sheik who had been required for certain offenses, to remain in Nasiriyah on security absconded, and all efforts made to induce him to return were abortive. An attempt was made by a force of mounted police to effect his arrest by surprise, but failed by a narrow margin, and the police, some of whom were wounded, were disarmed after a short struggle with considerably superior numbers. Air operations were asked for. These were restricted to the fort and gardens in which the sheik and the following he had gathered around him were hiding. This air action had the effect of isolating the sheik from the support he would otherwise have been able to draw freely from other sections of his tribe, and did considerable damage to his own house, his gardens and crops. After a short delay, all his relatives came into Government on his behalf and surrendered the rifles which had been taken from the police. Shortly afterwards he himself surrendered. This result was achieved in a most inaccessible district by the use of four airplanes.

In May, in the Dawanimah division, a sheik of a powerful tribe defied the authority of the Government officer, obstructed and threatened a force of mounted police sent into his area, and refused to come in for parlay. It is an area peopled by a stiff-necked and truculent group of tribes and prompt action was necessary. An ultimatum was dropped from the air on the sheik’s headquarters.

²⁶ Letter from Henry Dobbs to Air Marshall Sir John Salmond, 12 Feb 1924

²⁷ Jackson, Robert, *The RAF In Action, From Flanders to the Falklands*, Dorset: Blanford Press, 1985 19

When no answer had been received on its expiry, offensive action was taken. An air attack was made during one day, and, as a result, on the following day, mounted police with aircraft in close co-operation, were able to enter his village without opposition. Meanwhile the sheik came in to Government at Diwanimah and surrendered. The operation had an excellent effect throughout this somewhat difficult district.²⁸

The results of air actions in Iraq were dramatic. “By 1925 it was clear that air control had successfully maintained British influence in Iraq without the heavy expenditure implied by an army garrison...most British observers concluded that the absence of major military challenge to the Baghdad regime was largely due to the power of the bomber. ‘Air control has been so brilliantly, magnificently successful’ remarked Henry Dobbs (the High Commissioner) in March 1924 ‘that it has far outstripped the expectations of the Cairo Conference of 1921.’”²⁹

The reduction in cost to the British government was no less dramatic. “In the fiscal year 1921-22 British expenditure in Iraq totaled £23.36 million; in 1922-23, the first year of air control, this fell dramatically to £7.81 million; and by 1926-27 it was no more than £3.9 million. The last regular infantry battalion was withdrawn in 1929.”³⁰

The British had little success with air control in Palestine. During World War I, Britain’s General Allenby defeated the Ottomans for control of the Palestine region. By November 1917, with the Balfour Declaration, the British made it clear that they would “look favorably upon the creation of a Jewish homeland in Palestine.”³¹ This predictably incited the Arab population, and they began to revolt against the British Administration and the Jewish settlers. Churchill again attempted to replace the majority of ground troops with air control and the Air Ministry took over responsibility for Palestine by 1922. Things were quiet and aircraft were used mainly to patrol the frontier regions. “Lord Plumer, who replaced Sir Herbert Samuel as High Commissioner in 1925, was confident that the risk of serious communal disturbance had receded. . .[and he] disbanded the Palestine Gendarmerie, created a new Frontier force to serve in

²⁸ Salmond Sir John M., “Iraq Command Report, October 1922 – April 1924,” 26-27.

²⁹ Omissi. 35.

³⁰ Ibid, 37.

³¹ Ibid, 44.

Transjordan, and removed the last remaining regular troops.”³² These changes proved disastrous in 1929, when Arab rioting began again in response to increased Jewish immigration in 1928. Aircraft were unable to distinguish friend from foe from the air in the confused urban environment, and order was not restored until ground troops were rushed to the region. Troop strength continually grew until it reached a full two divisions by the mid 1930’s, and air control was pushed to a supporting role. The Army took over command of the Palestine regional security and air control was seen universally as a failure in the urban environment of Palestine. Fortunately for air control advocates, the concepts proved more successful later in the Southern Arabian region.

In the 1930’s, the British were suffering problems with tribal warfare and insurrection in the Aden Protectorate of Southwest Arabia. Confident that air control would work, “by 1930 all regular infantry had been withdrawn and the defense of the Protectorate lay with one RAF squadron, three armoured cars and a few hundred local levies.”³³ All air operations from 1934-1935 were under the command of AOC Air Commodore Charles Portal, who would later become Chief of Air Staff for Britain in World War II. Although a treaty was signed with the Imam of nearby Yemen in 1934, it was almost immediately violated by a tribe of Quteibis who raided a caravan coming from Yemen. A response was clearly required to show that the British expected the treaty to be upheld.

At this stage a government ultimatum was drafted, using two basic rules. Firstly, the law-breakers had to be given an alternative to being bombed, and they should be told in the clearest and simplest terms the governments full, final and irrevocable demands... The second rule was that the terms should never include anything that would be impossible to achieve or that was unreasonable. The actual ultimatum sent to the Quteibis read:

If you do not produce the fine and the men, you must leave all your villages and fields, taking your property and animals with you, and keep right away until the Government gives you permission to come back. The Government will do this as soon as you have complied with the terms. Until you have complied with the terms your villages and fields may be bombed or fired on at any time by day or night, and you are particularly warned not to touch any bombs that do not go off, as if you do so you will probably get killed.

³² Ibid, 44-45.

³³ Canavan, 23.

This ultimatum was given to the chief and copies dropped over the villages, with a ten day implementation time. Although this seemed a long time, Portal considered the rapid issuing of the ultimatum to be the critical timing element. Within a few minutes of the expiry of the deadline aircraft appeared at all key locations and dropped a few light bombs. The only heavy attack was against the chief's house and that of his uncle. A later heavy attack was made against one village of a group who had been part of the raiding party and who were known to be expressing contempt for the light bombing. They were at first defiant, shooting at aircraft, and talking of the revenge they would take. Then internal squabbling started, with various groups blaming each other for bringing on the trouble. There was also much fierce talk of the injustice of the government. Finally boredom set in, and a realization that they needed to get on with plowing if they were to sow before the onset of the rainy season. Finally various groups started to make independent peace offerings. The Quteibis immediately accepted the government's conditions in full and handed over the fine and hostages. The Political Secretary, who visited the tribe, assured them that the government's wish was for them to resume their peaceful lives as soon as possible. A bomb disposal expert was immediately sent to clear the area, accompanied by a doctor who found the tribe in remarkably good health.³⁴

Bringing the Quteibis of Aden under control was surprisingly bloodless. "The government had suffered no casualties at all, and the Quteibi lost three men thought to have been dismantling a delayed action bomb."³⁵ Clearly, the concept of air control had finally proven itself for the British.

Summary

Summarizing the British air control experiences of the 1920's and 30's, there were clear advantages and limitations to air control. Air control for the British was inexpensive, it minimized casualties on both sides, and it denied a geographical advantage to the enemy. Limitations, however, included the frail nature of the aircraft used, the weather, communications, and its lack of effectiveness in an urban environment due to the difficulty for aircraft to distinguish friend from foe. All of these strengths and limitations can be used to draw lessons about air control.

The most obvious and quantifiable strength of air control for the British was the cost savings. The operation in British Somaliland was quoted by British officials as 'the cheapest war in history,' costing £77,000, instead of the millions predicted by Sir Henry Wilson. The operation in Iraq reduced expenditures by over 83%, from £23.36 million to

³⁴ Canavan, 25-27.

£3.9 million per year. Not only the annual costs were reduced. The quick success in British Somaliland, for example, accomplished in three weeks what ground troops alone were unable to accomplish in the previous six years, negating the need for annual expenditures for future campaigns because the problem was solved. Finally, each individual operation during air control was cheaper because it was far less costly to send out flights of aircraft to patrol areas and quell disturbances, than to martial an entire column of troops with their associated heavier logistic requirements.

Air control helped to dramatically limit the casualties on both sides during most operations. Friendly casualties were minimized because fewer troops were exposed to combat operations. Only pilots, observers, armored car personnel and aircraft ground support troops took part in the operation, instead of entire columns of hundreds of troops and supply trains exposed to ambush. Aircraft were able to accomplish many punitive operations from an altitude above the limit for the enemy weapons available at that time, and were therefore able to operate with relative impunity. Casualties for the enemy were minimized by the tactics used for air control. The dropping of leaflets and targeting of villages after the occupants had fled made most operations almost bloodless. This allowed the diplomatic efforts of the operation to proceed with far less animosity on either side.

Finally, the speed and mobility of the aircraft allowed air control to be extremely responsive, and denied the enemy the sanctuary of distance or difficult terrain. Salmond pointed out the importance of responding to insurrections quickly, before they grew into major threats to control, and air control was ideal for accomplishing this objective. “Those peoples who had inhabited the swamplands, mountains and deserts on the fringes of the settled agricultural plains could, by reason of their remoteness, martial qualities and poverty, escape both the benefits and the drawbacks of civilization. The reach of the pre-industrial state into these areas was at best sporadic. Punitive columns of Indian troops could be sent into the Frontier Zone, but in default of expensive continuous occupation, such occasional visitations were transient in their effects. The emergence of the aeroplane as a weapon to enforce government demands irreversibly altered the

³⁵ Ibid, 27.

balance of power between the central state and the societies on its geographical margins.”³⁶

The first of the limitations for aircraft for the British was the frailty of the aircraft in use at that time. Many losses suffered by the RAF were due to engine failures or damage done by the weather to exposed aircraft. Strong gusts of wind could flip the aircraft and cause extensive damage, even after they were tied down. Weather could also prevent the aircraft from operating for extended periods of time. Dust storms in the Iraqi desert could ground the RAF for weeks at a time, limiting the effectiveness of air control during those periods. It does not take long for an enemy to discover the circumstances where aircraft are incapable of responding, then match their operation schedule to coincide with those periods when air power is grounded.

Early communications between the ground and aircraft were primitive at best. Pilots had to either drop notes from their aircraft to ground patrols to alert them to danger, or find a nearby place to land to communicate with them. Ground patrols could only communicate with the aircraft by using pre-arranged signals such as laying out ground markers in certain patterns. This lack of communications ability sometimes slowed the aircraft's response time to the point where the enemy could escape before the pilots were aware there was a problem.

Finally, and most significantly, it was extremely difficult for pilots to identify friend from foe from the air during confusing situations such as riots and urban disturbances. Pilots who flew in Palestine and attempted to control the Arab rioting found themselves unable to influence the situation on the ground without risking an unacceptable number of innocent casualties. Their bombs and machine guns were excellent when attacking fixed targets or enemies in the open, but in the tight confines of the urban environment of Palestine, they were ineffective. As a result, air operations failed to maintain control in Palestine and ground troops were required to restore order.

The British experiences in air control allow us to draw several conclusions about what conditions are required for air control to be a viable option. The experience in Iraq illustrated the requirement for dependable intelligence gathering and quick reactions to that intelligence before the enemy can escape. It showed how many fleeting

³⁶ Omissi, 211.

opportunities can be missed if there are no means of instant communications between the ground and the aircraft. RAF Captain John Glubb, in his book *War in the Desert, an RAF Frontier Campaign*, described several incidents where the location of the enemy was discovered but either the information could not be delivered to the aircraft in time, or the aircraft were grounded and unable to respond because of the weather.³⁷ Finally, the British experiences illustrated the extremely political nature of air control operations. Political considerations required the use of the minimum force necessary, the dropping of leaflets warning of attacks, the targeting of material that would cause inconvenience rather than fatalities, and the specifying of clear, realistic demands for compliance from the natives. All of these requirements are the exact opposite of sound tactics in warfare, but they demonstrate that the goal of air control is compliance, not destruction. These concepts continue to hold true for air control operations today, as will be seen in the next chapter.

³⁷ Glubb, 130.

Chapter 3

Modern Air Control Operations

Iraq and Bosnia – Concepts of Operations

Two modern examples of air control include Operation Provide Comfort over Northern Iraq, and Operation Deny Flight/Deliberate Force over Bosnia. The United States has adopted air control in these regions for the same reasons the British turned to air control to police their empire. Neither region is considered a vital national interest for the US, political and international support for the commitment of large numbers of ground troops is very low, and there is a strong desire to minimize the cost of the operation. Both operations were initiated in response to humanitarian interests, where the “CNN effect” resulted in calls from the public to “do something.”

The stunning performance of airpower and precision guided weapons in the 1991 Persian Gulf War, has given the US public the inflated perception that airpower is a simple, low casualty solution to any problem. The small footprint of air operations, their low risk to personnel, and their relatively low cost, make air control the first choice for dealing with regional crises. Unfortunately, there are many situations, like Palestine in the 1920s and Somalia in the 1990s, where facing factions operating in urban areas and confronted with vague political objectives for intervening forces have proven untenable for air control. Air control has been generally successful in Iraq and Bosnia primarily because the political goals have been limited. There is no attempt to set up a separate state of Kurdistan in Iraq, and there is no effort to militarily carve out a Bosnian-Muslim

state in the former Yugoslavia. Air control's limited aims are to help maintain a status quo in the region, to minimize the violence, and to prevent the situation from destabilizing while diplomatic efforts attempt to solve the long term problems. In this chapter, I will review the current political situations and concepts of operations for air control in Iraq and Bosnia. In Chapter Four, I will analyze the operational problems those efforts have faced so far, in order to identify lessons learned for modern air control.

Operation Provide Comfort/Northern Watch

Operation Provide Comfort is an outgrowth of the Gulf War and the failure of the subsequent Kurdish uprising to unseat the weakened Hussein regime. Because the retaliation by Saddam Hussein against the Kurds was so harsh, it caused an exodus of over three million people across the mountains in Northern Iraq to sanctuary in Turkey. According to the leader of the Kurdish Democratic Party, harsh conditions led to as many as 1500 Kurdish deaths per day from exposure.³⁸ As a result of the difficulties involved in delivering supplies in the mountains, on April 11, 1991, "President Bush, after meeting with the European community official, announced the U.S. and European allies were now 'in agreement on the creation of areas within Iraq where refugees could be protected.'"³⁹ To support the Kurds' return to northern Iraq, a no-fly zone was set up north of the 36th parallel. When coalition ground forces withdrew from the area, the no-fly zone was left in place to protect the Kurds from Iraqi air attack, and it continues to operate to this day.

The concept of operations for enforcement of the no-fly zone calls for the shooting down of any Iraqi fixed or rotary wing aircraft flying north of the 36th parallel in Iraq without express permission from the UN. Surveillance is accomplished by Airborne Warning And Control System (AWACS) aircraft and F-15C air superiority fighters. The air superiority aircraft are supported by numerous air-to-ground fighter aircraft, available for quick retaliation for any surface to air attack on coalition aircraft, and electronic combat aircraft, to monitor any radar activity and jam or destroy any radar which

³⁸ Goshko, John M., "Rebel Urges West to Aid Iraqi Kurds," Washington Post, April 12, 1991, A1

³⁹ Clary, David E., "Operation Provide Comfort – A Strategic Analysis", Maxwell: Air War College, Apr '94, pg. 10, Quoting John E. Yang, "Bush: U.S., "Allies Concur On Refugee Zones in Iraq," The Washington Post, Apr 12, 1991, pg. A-32

threatens coalition aircraft. This basic concept of operations has been carried out relatively unchanged for six years.

The AWACS aircraft is the first to arrive at the Tactical Area Of Responsibility, (TAOR), and it sets up a monitoring orbit north of the Iraq border in Turkey. “The ACO [Airspace Control Order] stated that the fighters would not depart Incirlik enroute to the AOR until the AWACS was in its orbit, was operational, and had established a computer data link with the ground.”⁴⁰ Once the AWACS is on station, the air superiority fighters were cleared to launch. The ACO then specified that “No aircraft will enter the TAOR until fighters with Air Intercept radars have sanitized the AOR.”⁴¹ Once they arrive, the fighters performed a sweep through Northern Iraq, confirm there is no air activity, then clear other coalition aircraft into the TAOR. All aircraft then orbit in Iraq, north of the 36th parallel, to monitor the area for unauthorized flights or ground threats against coalition aircraft.

The rules of engagement for enforcement of the no-fly zone concentrate on identification of any violator and a prompt response with decisive force. Although individual pilots are given the authority to unilaterally act in response to a violation by shooting down the offending aircraft, in reality, the difficulty of meeting the required criteria for identification of the violator forces the involvement of several players. In a typical case, either the AWACS or a fighter aircraft picks up a radar contact north of the 36th parallel or about to cross north of the line, and designates it as a “bogey”. This means the identification of the aircraft is unknown and requires further effort to track and identify it by all players. The fighters and AWACS then attempt to identify the contact using the Rules of Engagement, which require:

- a. Any unidentified airborne object in or approaching airspace within a U.S. air defense area of responsibility will be identified by any means available, including visual recognition, flight plan correlation, electronic interrogation, and track analysis.

⁴⁰ Article 32, UCMJ, Report, Investigating Officer Exhibit 52, cited in Eflein, Dawn R., “A Case Study Of Rules Of Engagement In Joint Operations: The Air Force Shootdown Of Army Helicopters In Operation PROVIDE COMFORT,” The Air Force Law Review, Spring 1998, 58.

⁴¹ Operation Provide Comfort Airspace Control Order, Vol II, para 16c, cited in Eflein, 58.

b. When feasible, airborne objects in or approaching the airspace within a U.S. area of responsibility that have not been satisfactorily identified by communications, electronics, or any other means will be intercepted for visual identification purposes.⁴²

The pilots in the fighters and the mission crew on the AWACS then check to see if the suspect aircraft is on the Air Tasking Order (ATO) for that time of day as an authorized flight, or if it is on the abbreviated “Flow Sheet” of all relevant missions and their critical flight data, carried on the kneeboards of the fighter pilots. The fighters and AWACS then attempt to identify the bogey by electronic means, specifically, by interrogating its Identification Friend or Foe (IFF) receiver. The IFF makes identification of friendly aircraft very reliable based on the response. Unfortunately, a lack of a response does not necessarily mean the aircraft is not a friendly. Further investigation is required to determine the target’s identity if there is no response.

If the bogey does not appear on the ATO or flow sheet and there is no response to IFF interrogations, then a visual identification pass is flown. If the visual inspection identifies the aircraft as unauthorized, it is designated a “bandit” and the air superiority fighters engage to destroy it. This process was successful in the shoot down of several Iraqi aircraft from 1991 to 1993, and has successfully deterred further violations of the no-fly zone by the Iraqis.

Coalition benefits from enforcing the no-fly zone are similar to the advantages the British gained in their successful air control efforts in the 1920s and 30s. The air operations for controlling Iraqi behavior have been more cost effective than using large ground forces to defend the Kurds. As of this date there have been no Iraqi caused injuries or deaths to coalition air forces. The UN coalition enforcing the no-fly zone enjoys excellent basing rights (so far) in Turkey, and largely as a result of the lack of casualties and small footprint in country, has maintained public and congressional support for the operation for seven years.

Much of the success of OPC and the lack of casualties can be attributed to overwhelming technological superiority of coalition forces and the excellent environment for operations. Technical advantages have allowed coalition aircraft to operate with

⁴² Article 32 Report, Investigating Officer Exhibit 12, (unclassified guidance on the ROE as found in the Aircrew Read File), cited in Eflein, 61-61.

impunity, even when the Iraqis have attempted to shoot down or intimidate them. Since Desert Storm ended, coalition forces have shot down four confirmed and one probable aircraft, and responded to Surface-to-Air Missiles (SAMs) and Anti-Aircraft Artillery (AAA) on 20 occasions without damage to any aircraft.⁴³ Weather and terrain in Iraq north of the 36th parallel and south of the mountains of the Turkish border are good for air surveillance. The ground is flat, with no opportunity for the Iraqi Air Force to use terrain masking to hide from coalition airborne radars.

Some of the problems of conducting air operations over Iraq include the unpredictability of the Turkish government over long term basing rights, the ambiguous nature of the threat posed by SAM and AAA radars, and the difficulties of quick identification and response to suspected violations.

Every six months, the Turkish Parliament votes on whether or not to extend permission for coalition aircraft to continue to operate from Turkish bases, most notably Incirlik AB. Since OPC began, the vote has consistently become less predictable as opposition members within the parliament call for an end to the foreign intrusion on Turkey. Short term support from the Turkish government has been outstanding so far, but the future will always be in question. Without an alternative for Turkish basing, the fate of the no-fly zone will always be in jeopardy.

Modern air defenses have become increasingly ambiguous concerning exactly when an aircraft is threatened. It is obvious that if a missile is fired or AAA tracers arc across the sky that an attempt is being made to shoot down an aircraft, but what if only a radar is turned on? What if the radar is tracking and illuminating the aircraft for attack but nothing has yet been fired. If the aircraft attacks because it feels threatened, can the enemy simply deny they ever intended to fire, and complain to the UN that the attack was unjustified? Even non lethal methods of response such as jamming could be considered by the enemy to be an act of war. These ambiguities must be carefully addressed when building a doctrine for air control.

Finally, the difficulties of identifying no-fly zone violations and responding before the fleeting targets escape can be very difficult. Excessive care in identifying

⁴³ Bruce, James, "Wider No-Fly Zone Turns the Screws on Saddam", Jane's Defense Weekly, 11 Sep 96 5

potential violators can take too long and allow the violator to escape, but a quick determination followed by a rapid response can result in fratricide as in the case of the two Blackhawk helicopters which were shot down in the Spring of 1994.

Operation Deny Flight/Deliberate Force

Operation Deny Flight/Deliberate Force is the other attempt at air control currently being attempted. When the former Federal Republic of Yugoslavia disintegrated, ethnic fighting developed as the six nations which made up Yugoslavia carved out their spheres of influence and tried to “ethnically cleanse” those areas. Most of the fighting was centered in Bosnia-Herzegovina between the Bosnian Muslims, the Bosnian Croats, and the Bosnian Serbs, with the US recognizing the Bosnian Serbs as the main aggressor. The initial response by the UN was to impose an arms embargo to minimize the weapons available for fighting. UN Security Council Resolutions (UNSCR) 713 and 757 authorized member nations to enforce the embargo in the Adriatic Sea. When this proved inadequate, on 9 October 1992, the UN passed resolution 781 to establish a no-fly zone over Bosnia-Herzegovina. The UN delegated enforcement of the no-fly zone to NATO in UNSCR 816, and Operation Deny Flight became NATO’s response on 12 April 1993.⁴⁴

As reports of Serb atrocities, primarily against Muslims, came to the attention of the world media, pressure mounted for the UN and NATO to take more positive actions to stop the killings. The UN responded by designating six areas as safe havens, Sarajevo, Tuzla, Bihac, Srebrenica, Zepa, and Gorazde. “UNSCR 836, passed on 4 June 1993, was a response to the fighting primarily initiated by Bosnian Serb paramilitary forces. It directed that NATO provide close air support (CAS) ‘in and around the safe areas to support UNPROFOR in the performance of its mandate.’ That mandate directed UNPROFOR to deter attacks against the safe areas, monitor the cease-fire, and, if necessary, use force to ensure freedom of movement of UNPROFOR or of protected humanitarian convoys.”⁴⁵

⁴⁴ Beale, Michael O., *Bombs Over Bosnia: The Role Of Airpower in Bosnia-Herzegovina*, Air University Press: Maxwell AFB, AL, August 1997 20

⁴⁵ Ibid, 22.

Despite these Security Council Resolutions, Serbs attacked the safe haven of Gorazde in April of 1994 and during the shelling of the town, they killed a UNPROFOR soldier. “NATO had not been willing to counter the Serb offensive against the town, but it did respond to protect UN soldiers. NATO fighters dropped bombs [in combat] for the first time in alliance history on 10 April 1994. The targets were a Serb mobile command post and a tank shelling the town from the position believed responsible for the UNPROFOR soldier’s death. Serb commander Mladic was furious and ordered his troops to surround 150 UNPROFOR soldiers positioned in Gorazde. He raged by telephone that if NATO did not stop its actions, not one UN soldier would leave alive...By 17 April, the Serbs had captured Gorazde despite NATO threats.”⁴⁶

After the Krijina Serbs launched air attacks against the Bijac pocket, NATO aircraft attacked Udbina, the airfield from which the Serb aircraft had operated. Once again, the Serbs responded by taking the lightly armed and vulnerable UNPROFOR soldiers hostage, then positioning them at possible targets to prevent air strikes. With the hands of NATO tied once again, the Bijac pocket was overrun, and “NATO’s reputation was so severely damaged that the entire alliance was threatening to unravel.”⁴⁷

The attempted solution to this loss of NATO credibility was the creation of a UN Rapid Reaction Force. “Their mission was peace enforcement, not peacekeeping, and represented a fundamental shift in the UN’s mission in Bosnia.”⁴⁸ When the safe havens of Srebrenica and Zepa were overrun in July of 1995, and Gorazde was threatened, the North Atlantic Council of NATO finally decided to take positive action against the Serbs. First, UNPROFOR soldiers were withdrawn to more defensible positions to prevent them from being taken hostage again. Next, planning for two operations, Dead Eye and Deliberate Force were completed.

Dead Eye was a plan to take down the Serb Integrated Air Defenses (IADs), while Deliberate Force was a plan to punish the Bosnian Serbs for their aggression. Both of these operations recognized the sensitive political nature of the situation. Dead Eye was planned to protect coalition aircraft from ground defenses while carrying out their

⁴⁶ Ibid, 25.

⁴⁷ Ibid, 29.

⁴⁸ Ibid, 33.

missions. A downed pilot could be used as a bargaining chip by the Serbs to try to stop the bombing campaign, so every effort was made to prevent the Serbs from getting that chance. "Deliberate Force was about diplomacy; getting the Bosnian Serbs to end their sieges on the safe areas and to enter into productive negotiations for peace."⁴⁹ The operation had very limited political goals, and political considerations were the first priority, as illustrated in the following excerpt from the Balkans Air Campaign Study, (BACS):

Reflecting his and Admiral Smith's [Commander in Chief, Allied Forces South] conviction that "every bomb was a political bomb," General Ryan [Commander, Allied Air Forces Southern Command] personally oversaw the selection of every DMPI [Desired Munition Point of Impact] in every target. He also personally scrutinized every selection, or 'weaponizing,' decision made for the actual weapons to be used against DMPIs, and he examined or directed many tactical decisions about such things as the strike launch times, the specific composition of attack formations, and the selection of bomb-run routes.⁵⁰

Because collateral damage was a major targeting consideration, "Of the 1,026 bombs and missiles expended during Deliberate Force, 708 were PGMs. [Precision Guided Munitions]"⁵¹

The trigger event for Dead Eye and Deliberate Force was a mortar attack on the Mrkale market in Sarajevo on 28 August 1995. No offensive action was taken during the first 24 hours after the attack, in order to give UN troops in country a chance to withdraw into defensible positions to avoid Serb retaliation,. Once it began, the air operation lasted only 22 days, and "during the 22 calendar days of Deliberate Force, NATO aircraft and a single US Navy ship firing a volley of Tactical Land Attack Missiles (TLAMs) actually released weapons against the Serbs on just 12 days. Two days into the campaign, at the request of General Janvier [UNPROFOR Commander], NATO commanders halted offensive air operations against the Serbs for four days to encourage negotiations. When useful negotiations failed to materialize, they resumed bombing on the morning of 5 September and continued them through the 13th."⁵²

⁴⁹ Owen, Robert C., "Balkans Air Campaign Study," Draft, School Of Advanced Airpower Studies, Maxwell AFB, AL, October 1997, Summary, 18.

⁵⁰ Ibid, 14.

⁵¹ Ibid, 17.

⁵² Ibid, 14.

Although the Muslim and Croat ground offensives were credited with putting a great deal of pressure on the Serbs, the air campaign seems to have been the decisive factor in the Serb capitulation. During the summer ground offensive the Croats had gained back all of the land they had lost, and the Muslims had reduced the Serb held Bosnian territory from 70% to 51%, but despite their continued losses, the Serbs still refused to negotiate.⁵³ The bombing campaign, however, had an immediate and profound impact on the Serb leadership. “Prior to the bombing, Ambassador Christopher Hill observed, President Milosevic ‘always had a rather cocky view of the negotiations, sort of like he’s doing us a favor,’ but after the bombing began ‘we found him. . .totally engaged. . .[with an] attitude of let’s talk seriously’. . .on 13-14 September. . .Ambassador Holbrooke found Mladic, ‘in a rush’ to end the bombing. . .After six hours of negotiations, the Serbs unilaterally signed an agreement to cease their attacks on and remove their heavy weapons from Sarajevo, without a *quid pro quo* from Holbrooke or the UN stopping the bombing.”⁵⁴ No coalition aircraft were lost in the attacks, and airpower appeared to have been a decisive factor. Ambassador Holbrooke said “airpower broke the back of the Bosnian Serbs and directly led to the outcome in Ohio.”⁵⁵ Referring to the air and ground campaigns, Gen Ryan said “It took both, air power nailed down the forces, hamstringing the BSA’s [Bosnian Serb Army] ability to communicate and respond to the western offensive.”⁵⁶

Air operations over Bosnia provide lessons on how to use, and not use, airpower in peace operations. Strengths of the operation include many of the same advantages as those enjoyed over Iraq. Coalition technical dominance and air supremacy are again evident, and basing rights and refueling abilities are excellent. Operating out of Italy “a force of more than 160 NATO military aircraft continue to fly 80 to 100 sorties a day over Bosnia-Herzegovina. The daily Bosnian military flying operations involve more than 4,500 personnel from 12 countries.”⁵⁷ Capabilities for surveillance have increased

⁵³ Ibid, 19.

⁵⁴ Ibid, 20.

⁵⁵ Beale, 31.

⁵⁶ Interview with Gen Ryan by Maj Tim Reagan (AFSAA) and Dr. Wayne Thompson (HQ USAF/HO), 18 October 1995, cited in BACS, Chapter 8, 6.

⁵⁷ Corsini, Roberto, “The Balkan War: What Role For Airpower”, *Airpower Journal*,

dramatically over recent years with the use of Joint Strategic Targeting And Reconnaissance System (JSTARS) and Unmanned Aerial Vehicles (UAV's) to supplement the AWACS aircraft. Finally, air control enjoys a high confidence level from the American people and government. The small footprint and the ease with which it can be withdrawn if the situation deteriorates make it the method of choice. Recent congressional debate over whether or not to continue our ground presence in Bosnia has never even questioned the continued presence of the air assets.

Chapter 4

Modern Air Control Operations

Iraq and Bosnia – Lessons Learned

There are numerous lessons learned from both Iraq and Bosnia that need to be evaluated in detail before a comprehensive doctrine for air control can be developed. By studying the mishaps and problems in each of these operations, we can clearly illustrate some of those positive and negative lessons, and draw conclusions about what works and does not work in modern air control operations. In the case of Operation Provide Comfort, this study will closely examine the accidental shootdown of the two US Army Blackhawk helicopters to illustrate the problems in ROE, training, and interservice cooperation. In Operation Deny Flight/Deliberate Force this study will examine the environment for operations, the complicated political situation, and the poor chain of command between the US, NATO, and the UN. Some of the lessons are obvious, but others are subtle, due to the complex political nature of the situations. By analyzing the problems in depth it will be possible to expose the underlying problems and develop a doctrine to deal with them.

Operation Provide Comfort

The tragic shootdown of the two Army Blackhawks over Northern Iraq resulted in the deaths of 21 UN military personnel and 5 Iraqi Kurds. A study of the circumstances and command failures which led to this disaster is essential to ensure that future doctrine will be structured to reduce the possibility of a recurrence. The Blackhawk shootdown was the result of several preventable mistakes. Many argued that it was only a matter of

time before a disaster happened, given the problems with the ROE and the concept of operations in Northern Iraq.

In the Fall of 1993, Air Force Secretary Sheila Widnall illustrated the Air Force's attitude towards the proposal to provide Air Force crews with the specialized training needed for conducting peace operations. "Our operational flying missions in support of U.N. peacekeeping have not required special training programs. . .Pre-mission briefings are sufficient."⁵⁸ The accident investigation after the shootdown, however, found the opposite to be true. It found that inappropriate ROE and insufficient training were directly responsible for the accident. Both problems were blamed on a lack of command involvement with these issues. A brief review of the events, as related in the Air Force Law Review⁵⁹ highlight the shortcomings of the ROE and concept of operations in Operation Provide Comfort.

On the morning of 14 April 1994, an E-3B AWACS aircraft took up station north of Iraq for monitoring of the no-fly zone. Shortly after the AWACS arrived, two Blackhawk helicopters from Diyarbakir, Turkey, radioed the enroute controller to report they were proceeding into the TAOR. They landed at Zakhu, Iraq, to pick up passengers, then took off again to fly deeper into the no-fly zone. As had become routine for army helicopters operating in Iraq, they violated several of the requirements specified in the Airspace Control Order,. First, they did not change to the TAOR frequency or contact the TAOR AWACS controller, so the TAOR controller did not realize the helicopters were in the area. As a result, the Blackhawk's IFFs were never checked by AWACS for proper operation prior to entering the TAOR. Also, neither helicopter switched their Mode I IFF from the enroute setting to the TAOR setting.

Meanwhile, two F-15C's arrived on station to monitor air activity in the TAOR. They checked in with the AWACS enroute controller first, but the enroute controller did not inform them of the Blackhawks. The F-15's then switched to the TAOR frequency and proceeded to conduct their initial sweep of the area for any Iraqi aircraft, in accordance with the ACO, prior to clearing any coalition aircraft into the TAOR. The

⁵⁸ Auster, Bruce B., "The Perils of Peacekeeping," US News and World Report, Apr 25, 1994, 28-30, in Eflein, 33.

⁵⁹ Eflein, 33-74.

TAOR controller did not tell the F-15's about the Blackhawks because he did not know about them himself. When the F-15 flight lead's radar painted the Blackhawks in the TAOR, he was surprised because there was nothing in the ATO or on his flow sheet that was supposed to be in the area. He assumed, therefore, they must be Iraqi. When he informed the TAOR controller of the contacts, the controller said he had no friendly aircraft there. Because the Blackhawks were not on the TAOR frequency, they did not hear any of this conversation. The flight lead then attempted to electronically identify the radar contacts. When the F-15's interrogated the Blackhawk IFF they repeatedly got no response. With nothing friendly listed on the ATO or flow sheet and no response to any IFF interrogations, the F-15 flight lead closed for a visual identification pass.

As the flight lead approached within 5 nautical miles of the unidentified aircraft, he saw a single helicopter flying at very low altitude. The flight lead began his [visual identification] pass at approximately 450 knots indicated airspeed. The helicopter was flying. . .approximately 120 to 200 feet above the ground. . .In an attempt to make a visual identification, the flight lead descended below the tops of the hills and flew to a [reported] position of 1000 feet left and 500 feet above the helicopter's flight path. . .[As he started to climb and turn right] he saw a second helicopter in trail. . .⁶⁰

Seeing the external fuel tanks on the sides of the Blackhawks, he thought they were weapons pods so he misidentified the helicopters as Iraqi Hinds. He then instructed his wingman to also make a visual pass. His wingman passed approximately 2000 feet to the right of the second helicopter. Because he did not see any conclusive evidence to convince him that they were not Hinds, he did not dispute his flight lead's conclusion. The flight lead then informed AWACS that he was "engaged" and fired an AIM-120 AMRAAM radar guided missile, which destroyed the trail helicopter. His wingman then fired an AIM-9 heat-seeking missile which destroyed the lead helicopter.

⁶⁰ USAF AIRCRAFT ACCIDENT INVESTIGATION REPORT: U.S. ARMY UH-60 BLACKHAWK HELICOPTERS, 87-26000 & 88-26020, vol 2 at 46-48 (27 May 1994),

The destruction of the Blackhawks was obviously a case of tragic misidentification by the F-15 pilots, but there were also many other factors which led up to the mishap that we can learn from. The ROE in place at the time of the shootdown were “status-based” ROE, instead of “conduct-based” ROE. Status-based ROE means that if a person or vehicle is declared an enemy, it can be attacked and destroyed, regardless of whether or not it is committing a hostile act. Status-based ROE are usually reserved for wartime, where killing the enemy is almost always the right decision. Conduct-based ROE means that a person or vehicle cannot be attacked unless it commits or is deemed to be about to commit a hostile act, regardless of its identity. A legitimate case might be made for using status-based ROE for fixed wing aircraft over Iraq, because the speed with which they could attack would make them able to hit targets prior to being determined hostile by their actions. In their case, it makes sense to use status-based ROE, but for slow moving vehicles like helicopters, there is no need for them. Conduct-based ROE are more appropriate when there is time to evaluate a situation as it develops and make a hostile determination based on conduct. In the case of the Blackhawks, “There was nothing to imply hostile intent and the flight lead testified [in the Article 32 hearing] that he did not feel that the helicopters were a threat. The wingman also testified that Iraqi Hinds would not be a threat to an F-15.”⁶¹ Over the three years of OPC to that point, “No evidence shows that the ROE were reviewed, much less updated, until after the shootdown. Because of the reduced air activity north of the 36th parallel, much of the justification for a status based ROE had disappeared by 14 April 1994.”⁶²

Next, training of the aircrews was obviously inadequate in visual recognition for helicopters. Despite the fact that the F-15 flight lead had worked with the Army as a liaison officer and had flown many times on Blackhawk helicopters, he had never seen them with external fuel tanks, and neither he nor his wingman had received visual recognition training for helicopters in their various configurations.⁶³

Finally, the coordination between the Air Force and the Army contingents of the Coalition Task Force was inadequate. “The CTF Commander was responsible for all

in Eflein, 52.

⁶¹ Eflein, 63.

⁶² Ibid, 66.

crossborder operations, both air and ground, into Iraq,”⁶⁴ and “The Combined Forces Air Component Commander (CFACC) was in charge of air operations [which] included tactical control of the Blackhawk, AWACS, and the F-15 aircraft involved in the accident.”⁶⁵ This clearly put the Army forces in Turkey under the command of the CTF CG and the CFACC, yet no coordination between Incirlik AB and the Military Coordination Center at Diyarbakir took place. Despite the fact that “The fighter squadrons used the Air Tasking Order as the definitive guide for activity within the AOR. . .The Army helicopters were not adequately reflected on the ATO. . .In fact, helicopter operations were not considered by many of the players to be part of Operation Provide Comfort.”⁶⁶ The helicopters routinely ignored the directives in the Airspace Control Order, and the F-15 squadron had no way of knowing what friendly helicopter operations would be taking place each day in the TAOR. “No viable communication system was operable between the Military Coordination Center [at Diyarbakir] and the F-15 squadron.”⁶⁷ In an area where the use of deadly force was authorized in a status based ROE, this lack of coordination was unacceptable.

Operation Deny Flight/Deliberate Force

Operational difficulties for Deny Flight/Deliberate Force include a difficult environment for operations, a difficult and complicated political situation in the country, and poor command and control by the coalition and the UN.

The physical environment of the former Yugoslavia presents many challenges to air control. The weather is frequently bad and the terrain is mostly mountainous and difficult to patrol. Unauthorized flights by helicopters are very difficult to detect in the rugged terrain, and most can simply land wherever they are before action can be taken. As a result, coalition forces have not attempted to enforce the no-fly zone against rotary wing aircraft. Much of the air surveillance for detecting fixed wing aircraft has to be accomplished over the country itself by fighters because stand-off radar platforms such as

⁶³ Ibid, 67.

⁶⁴ Ibid, 47.

⁶⁵ Ibid, 47-48.

⁶⁶ Ibid, 55, 58.

⁶⁷ Ibid, 55.

AWACS or ship borne radars cannot see through the mountains. Fortunately there are very few airfields in country which can support fixed wing operations, so the Combat Air Patrol (CAP) aircraft can simply monitor those airfields for any activity. Also, because the Serb aircraft are only day/Visual Flight Rules (VFR) equipped, they are unable to use nighttime or bad weather to operate while avoiding coalition aircraft.

The political situation in the former Yugoslavia is complicated and confusing, making any type of coherent control from the air very difficult. It is impossible to distinguish from the air between the different forces competing in the ethnic and religious Bosnian civil war which has few clear geographic boundaries between combatants. Even the ground commanders have complained of the impossible nature of the situation. “According to Canadian peacekeeper and former UNPROFOR commander, Gen Lewis MacKenzie, ‘Dealing with Bosnia is a little bit like dealing with three serial killers. One has killed 15. One has killed 10. One has killed five. Do we help the one that has only killed five?’”⁶⁸ Until the political situation is understood on the ground, it is difficult to expect to control it from the air.

Many of the weaknesses in the air control of Bosnia can be traced back to the poor command and control exercised by the UN and NATO. From the beginning, there has been confusion as to the exact mission of the UN in Bosnia. Initially, the mission was referred to by the UN as a peacekeeping mission. The definition of peacekeeping, however, specifies that peacekeepers must be impartial, they must have the consent of all parties to be there, and they can only use force in self-defense.⁶⁹ The rule of thumb for peacekeepers is that if you have to keep using self defense, you probably don’t have the consent of the parties involved and peacekeeping operations are inappropriate. The Bosnian Serbs clearly did not consent to the peacekeepers being there, and it was unrealistic to expect the peacekeepers to remain impartial in the face of the ongoing genocide, ethnic cleansing, and attacks on UN troops. Challenges to the peacekeeping mission mounted as food convoys were blocked and sometimes attacked, and the death toll of peacekeepers killed in the crossfire steadily climbed. When the Serb parliament

⁶⁸ Beale, 44.

⁶⁹ Army Field Manual 100-23, *Peace Operations*, HQ, Department of the Army, December, 1994, 12.

officially rejected the Vance-Owen Peace Plan in May of 1993, the US began to push for offensive military action in the form of airstrikes against the Serbs.⁷⁰ NATO, however, was very reluctant to go along, and the UN was strictly opposed.⁷¹ NATO was concerned for the safety of the lightly armed peacekeepers on the ground throughout Bosnia, while the UN was trying to cling to the illusion that this was still a peacekeeping operation. It was not until 1995, after several hostage taking incidents by the Serbs, that the UN Rapid Reaction Force was created with appropriate ROE to conduct peace enforcement, rather than peacekeeping.⁷² The difference of opinion over what type of operation was needed, and what type of operation was being conducted resulted in vulnerable troops in country operating with unrealistic peacekeeping oriented ROE.

Growing out of this disagreement over the mission of the UN forces came a mistrust of the US by the UN. The UN was concerned that the overly aggressive posture that the US wanted to take would cause the situation to get out of hand, so the UN Secretary General maintained a “dual key” approach to approving any offensive strikes against the Serbs. This meant that both NATO and the UN had to approve of a strike before it could be carried out. If the need for emergency CAS arose, “The NATO chain of command went from the fighter aircraft, through an airborne command and control C-130, to the Combined Air Operations Center at Vincenza, Italy, where the Combined Force Air Component Commander (CFACC) was the approving authority for employing ordnance. The other chain of command went from the UNPROFOR forward air controller on the ground through the Bosnian Air Support Operations Center located at Kiseljak, Bosnia, and then to Zagreb. There, the UNPROFOR commander asked UN Headquarters in New York for permission to employ ordnance. . .Essentially, getting clearance to execute CAS in a timely fashion proved nearly impossible from the beginning.”⁷³ By the time these two chains of command responded, it was usually too late to take effective action. This process was not corrected until July of 1995 when “UN

⁷⁰ Beale, 21.

⁷¹ Ibid, 22.

⁷² Ibid, 33.

⁷³ Ibid, 22-23.

Secretary General Boutros-Ghali delegated strike authority for the UN to the military commander of all UN troops in the former Yugoslavia, French Gen Bernard Janvier.”⁷⁴

Finally, aircraft operating in Bosnia face the same problem as those enforcing the no-fly zone over Iraq when trying to determine exactly when a SAM system is threatening them. This problem was highlighted by the shoot down of US Air Force Captain Scott O’Grady’s F-16 by an SA-6 in June of 1995.

Summary

There are numerous lessons to draw from these examples of modern air control. Operation Provide Comfort showed the importance of appropriate training, ROE, and inter-service coordination. Deny Flight highlighted the importance of a straightforward chain of command, proper ROE, and recognition of the political realities of peace operations.

Training was clearly deficient in Provide Comfort for all of the flight crews involved. The fighter pilots’ misidentification of the Blackhawks as Hinds was inexcusable. No commander should allow his pilots to climb into air superiority aircraft without basic visual identification skills. The AWACS crew did not use proper hand-off procedures for keeping track of the helicopters, so the Blackhawks got lost in the shuffle. An adequately trained AWACS crew should have been able to sort the confusing situation out, or at least tell the F-15’s to hold their fire until the situation was clear. Finally, the training of Army helicopter pilots was shown to be inadequate when they repeatedly disregarded the Airspace Control Order, not realizing the grave danger they were putting themselves in. Disregarding the ACO while flying in an area of air superiority fighters with status based ROE, was as foolish as wearing a brown furry coat and antler hat while hiking in the forest on the opening day of deer hunting season. It is still the hunter’s responsibility to know what he is shooting at, but the hiker shares the blame for the inevitable accident.

The status-based ROE in Provide Comfort were inappropriate by the time of the shootdown. Despite the fact that the situation had changed dramatically in the three years since Provide Comfort started, there had been no changes in ROE and there is no

⁷⁴ Ibid, 34.

evidence that it was ever officially reviewed. As a minimum, the ROE should be reviewed with each change of senior staff members during a long-term operation. Also, status-based ROE should be reserved for wartime and special circumstances. The chance for fratricide when conduct-based ROE are used is much lower because it is seldom that a friendly will commit or appear to be about to commit a hostile act against his own forces. A periodic review of the OPC ROE would most likely eventually challenge the need to shoot first and ask questions later in non-time critical situations.

Finally, the OPC inter-service cooperation between the Air Force and the Army was inadequate. In order to operate together effectively, either all flights (including helicopters) must be specified clearly on the Air Tasking Order, or special rules must be developed to allow a group of flyers to operate independently. This can be done by geographically separating the special units, separating them by timing, or by prohibiting the shutdown of any helicopters, as in Deny Flight. Also, more open communication is required between units than was seen between the F-15's and the Blackhawks. The F-16 squadron was able to obtain information on the Blackhawks in order to avoid a possible midair collision, the F-15 squadron should have been able to do the same. The problem with flights not being relayed to the F-15's had already been highlighted in an earlier incident. "The same F-15 squadron involved in the shutdown had a previous problem with a Russian aircraft that was not on the flow sheet. In that case, a visual identification was properly made and tragedy averted, but [i]t was found out that the people at CTF staff knew about the flight plan for that and didn't pass it down."⁷⁵ Although there was a lot of yelling after this incident, obviously not enough effort was made to ensure that everything that flew in the TAOR was on the flow sheet.

In Deny Flight, a major problem for air control was the "dual-key" chain of command for approval of air strikes. In limited conflicts, where some of the players are using hit and run tactics against the occupying force, reactions to attacks must be swift in order to punish the attackers before they can escape. This problem was illustrated in Iraq during British air control, and it remains true today. A cumbersome chain of command which takes up to hours to give approval for attack is incapable of taking effective action against a hit and run force. Air operations in Bosnia were not very effective until

Deliberate Force, when the military commanders were given the authority to conduct coordinated strikes. General Ryan's close scrutiny of each target and attack during Deliberate Force showed that commanders can be given a high degree of freedom of action without losing political control.

The ROE were a problem in Deny Flight, just as they were in OPC. A UN reluctance to recognize the reality of the situation and accept the fact that the Bosnian peace operation had changed from peace keeping to peace enforcement, resulted in ground forces being placed in overly vulnerable positions. This situation tied the hands of airpower repeatedly as the Bosnian Serbs simply took UN peacekeepers hostage and used them as human shields any time air control attempted to influence ground events. Deliberate Force allowed a 24 hour delay for UN troops to pull into defensive positions, but again, this makes rapid reactions to events impossible.

The greatest strength of Deny Flight and Deliberate Force was the realistic view of the leadership to the political situation. Even during the intense air campaign of Deliberate Force, political considerations were closely followed. When the North Atlantic Council (NAC) voted to resume bombing on 5 September, after the four day delay, the Serbians were shocked. "The resumption of airstrikes dashed President Milosevic's hopes that NATO had once again spent its energy in a half hearted air campaign and that the predictable pattern of protracted negotiations would follow."⁷⁶ Gen Ryan and Admiral Smith saw the operation as a method to bring the Serbs to the negotiating table, not simply a list of targets to be destroyed. Ryan recognized the fact that attacking Bosnian Serb command, control, and communications facilities in the midst of the Croat and Muslim offensive would put the Serbs in a hopeless political situation where accepting the peace terms would be the smartest option. At the time of Deliberate Force, the Bosnian Serbs controlled militarily the same territory being offered to them at the peace table. Continued fighting could only cost the Serbs more land and forces, so they decided to accept the peace offers.

⁷⁵ Eflein, 72.

⁷⁶ McLaughlin, Mark C., "Balkans Air Campaign Study," Draft, School Of Advanced Airpower Studies, Maxwell AFB, AL, October 1997, Chapter 8, 4.

This successful use of air control to bring about limited political objectives, along with the other lessons learned by the British in the 1920s and 30s, and by the UN coalition in Operation Provide Comfort, can be used to build a doctrine for the use of airpower in Operations Other Than War.

Chapter 5

Developing Operational and Tactical Doctrine For Air Control

Drawing from the examples of British air control and the ongoing UN attempts at air control in Iraq and Bosnia, there is enough historical data to create a practical doctrine for executing an air control campaign. Some of the concepts discussed in this study can apply to any air campaign, but because of the highly political nature of the situations that air control must address, there are numerous subtle differences that are critical to understand in order to conduct an air control campaign. This requires a detailed understanding of aircraft tactics as they are applied to the highly political environment of air control. This proposed doctrine for air control will address the basic concept of operations, self-defense, and defense of others.

Concept of Operations

A doctrine for the overall concept of operations must address many of the issues common to all air control campaigns. These include basing rights and host nation support, High Value Air Asset (HVAA) operations, asset requirements, weather considerations, and command and control.

First, and most important, is the issue of basing rights. For short-term operations in close proximity to the sea, the Navy can provide carrier based aircraft, but a long-term presence using only carriers will be extremely difficult to maintain. In places like

Northern Iraq, far from the sea and surrounded by other countries, foreign basing is required. When looking for bases, no airstrip in a region should be overlooked because under the current “bare-basing” concept, modern aircraft are capable of operating with only a runway and a potable water source. Finally, the distance from the bases to the operating area will dictate what types of aircraft can be used to patrol and how many air refueling assets will be required.

The next consideration is what host nation support will be available. A runway and a potable water source is the minimum, but anything else that can be provided by the host nation will reduce the strain on US air and sealift. One of the most important resources to obtain from the host country is fuel. Operations are greatly complicated if fuel has to be flown in. A critical factor for obtaining fuel and other supplies will be the availability and condition of port and transportation facilities. If a new port is required or extensive repairs are needed for the host country ports and infrastructure for the transport the fuel and supplies to the airbase, flight operations will be directly affected until the improvements are completed. One short-term option to provide fuel to remote airfields is to operate air refueling tankers from a location where fuel is available and always refuel patrol aircraft to their maximum landing weight just prior to landing so they have fuel to take off for the next mission. This can offer a temporary solution, but obtaining a more dependable source of fuel should be a top priority in these operations.

All air control operations will require sophisticated surveillance and intelligence gathering platforms. These include AWACS aircraft for air surveillance, JSTARS aircraft for ground surveillance, RC-135's for electronic surveillance, and Unmanned Aerial Vehicles (UAV's) for reconnaissance. Because these assets are expensive and in

severely limited supply, they are referred to as High Value Air Assets. These assets, with the exception of UAVs, should not be placed in a high risk situation except under the most extreme of circumstances. The first job for an air control planner is to develop guidelines for the exploitation of these assets without unnecessarily risking them to enemy action. This will involve a detailed study of the enemy capabilities including special operations forces, terrorist assets, surface-to-air missiles and guns, or air-to-air fighters.

Basing of HVAA will require high security at a safe location to protect the assets from special operations forces or terrorists while they are on the ground. Fortunately, the long range capabilities of all of these assets allows them to be based a long distance from the target country and complicates attempts to threaten them.

While flying, the HVAA orbits should be kept at a sufficient stand-off distance to avoid all known surface-to-air threats, and electronic surveillance aircraft should be constantly monitoring for any new threat that could potentially reach the HVAA. The distance that the HVAA must keep between itself and the surface threat will be a trade-off between the threat faced and the need to get in close to maximize the capabilities of the sensors.

Every HVAA commander's worst nightmare is a dedicated attack by enemy air assets to shoot down our HVAA. Air-to-air fighters provide a constant screen against the air threat, but if the enemy launches a large number of interceptors, even something as unsophisticated as MiG-23's or MiG-25's, there is the possibility that the fighter screen would be unable to kill them all, resulting in a few "leakers." Even one interceptor getting through could potentially destroy a large and vulnerable HVAA like AWACS. If an AWACS or another HVAA were lost to enemy attack, it would result in a loss of life which could undermine congressional or public support for the operation. Early warning and quick response procedures must be developed to help to avoid this possibility, and consideration should be given to providing constant area jamming of enemy radars to screen the exact location of the HVAA in their orbits.

Necessary support assets will vary according to the mission and the threat. Most types of operations will require surveillance assets and fighter protection at least. If an aircraft must overfly enemy territory, Suppression of Enemy Air Defense (SEAD) aircraft will be required. If the mission is to support ground troops, air-to-ground capable aircraft will be required, particularly those equipped to carry Precision Guided Munitions (PGMs). Once the assets are in theater, ROE will need to be developed for the assets required for each mission. For example, if the SEAD assets are unable to fly that day, can other assets go into the operating area? If they are allowed to go in, must they avoid the known threat rings? What must AWACS do if its fighter escort needs to leave for some reason? Should they stay on station while waiting for fighter replacements to arrive? Special Instructions (SPINS) and ROE for the operation should address all of these foreseeable circumstances and be presented to the aircrews before they start to fly in theater. This would go far to help avert the kind of embarrassment that resulted from the O'Grady shootdown in Bosnia in June of 1995. It was not until after the F-16 was shot down that the SPINS were changed to say aircraft would not enter the airspace over Bosnia without SEAD assets on station.⁷⁷

Closely associated with the SPINS for required support assets will be the requirement to specify weather minimums for operations in the airspace. It is dangerous to operate in clouds or over a cloud deck in any SAM environment. If a missile is launched at an aircraft, the pilot will be unable to visually acquire it until after it breaks through the cloud deck - which is often too late to avoid it. ROE needs to address either minimum operating heights above cloud decks or prohibit flying through known SAM threat rings when unable to see the ground.

The geography of the target nation will determine what type and how many resources will be required. An easily monitored area, like the flat, desert terrain of Iraq, will require relatively few assets. Mountainous terrain, like that in Bosnia, will require, at a minimum, assets which can monitor each mountain pass and choke point, and some type of self protecting airborne radar overhead to look down into the valleys for enemy aircraft attempting to terrain mask. Jungle terrain will be the most challenging because monitoring through the dense overgrowth is extremely difficult. Advances in sensor

⁷⁷ Beale, 33

technology have made the job more efficient, but the job will still require numerous and sophisticated assets. Unmanned Aerial Vehicles have greatly increased in capability over the past decade, attaining the ability to remain aloft for days at a time, (indefinitely for solar powered UAV's like the Pioneer or Helios in demonstration prototyping now by NASA⁷⁸), while carrying advanced sensors including Forward Looking Infra Red, Synthetic Aperture Radar, Multi-Spectral Imagery, and TV cameras. It is becoming increasingly difficult for opponents to hide or move undetected. Other geographic factors will include distances involved in patrolling, the number of airfields and lines of communication which must be monitored, and the regional weather.

Command and control has consistently been a problem in air control operations. Nowhere was this more obvious than during Operation Deny Flight. As described in Chapter Three, the "Dual Key" approach to time critical requests for CAS in Bosnia was ineffective. One of the original lessons learned by the British about air control was that air power's inherent speed and mobility could negate the advantages that geography and surprise provided to the enemy. The slow response time by the UN command and control structure gave away this advantage and the Bosnian Serbs were able to exploit the situation. Clear guidelines and better ROE can make it possible for senior commanders to delegate decision making to the appropriate level. This can allow the quick responses which take full advantage of airpower's strengths, making it possible to deal with situations before they get out of hand.

There will always be a reluctance to relinquish decision-making control, particularly when the political consequences of action are high. This forces a trade-off between allowing subordinates the freedom of action they need to be effective and maintaining control of the situation at the appropriate political level. Nobody wants an aggressive young pilot to drag the UN into a war before senior leaders have a chance to think through the situation to the end game. Short-term solutions can also be devastating to overall policy objectives. One suggested solution to this dilemma is to use our advanced communications capability to keep the appropriate commanders involved as the situation develops. A general officer on duty who monitors the situation constantly while

⁷⁸ Curtis Peebles, *Dark Eagles: A History of Top Secret US Aircraft Programs*, (Novato, Ca.: Presidio Press, 1995), 202-207.

forces are in the operations area, possibly even aboard AWACS or an Airborne Command, Control, and Communications (ABCCC) aircraft, could provide the kind of real time policy guidance that some political situations require. This would minimize the amount of delegation of authority required from the UN, and maximize the speed of response to the pilots on the scene.

Rules Of Engagement for Self Defense

Rules of engagement for self defense are potentially one of the most important operational issues to be addressed by the air planner and policy makers. Public and congressional support for an operation can be undermined if aircraft are shot down because they were not properly protected, or if there is a perceived overreaction to a minor threat. There are three major aspects of self defense which must be addressed for airpower assets in the theater of operations, these include ground protection of air assets at home bases, protection from the enemy air-to-air threat, and protection from the surface-to-air threat. Each of these aspects needs to be addressed prior to deployment, because they will affect desired basing and air assets required for safe operations.

Ground Defenses

Ground protection of forces will be a major consideration in any deployment for air operations. Most enemies of the US are aware of the reluctance of Americans to lose lives serving in areas which may not constitute core national interests, and they recognize US casualties as a key center of gravity. "US military members, their families, and facilities have become important, and increasingly frequent, targets over the past 25 years. Terrorist attacks have killed over 300 DoD service members and civilians and

injured more than 1,000 during this period.”⁷⁹ The disasters in Beirut, Lebanon, and Khobar Towers in Dahrhan, Saudi Arabia, illustrate the dangers posed by terrorism.

Because air assets are frequently the first to be introduced into regional hot spots, air commanders are increasingly finding themselves in command of the operations. As noted in the Khobar Towers case, air commanders tend to take ground security less seriously than air security. Unfortunately, it does not matter to the enemy if our jets cannot fly because he shot them down or if they are grounded because he killed the pilots and ground crews at their bases - the results are the same. In any case, the greatest potential for taking casualties is on the ground where personnel are densely concentrated, not in the air where pilots and crews can only be killed one or two at a time. For this reason, base security must have a higher priority with airmen. Critical threats which need to be addressed are bomb attacks, sniper attacks, and attacks during take off and landing.

The bombing of Khobar Towers in June of 1996 killed 19 airmen and injured another 500.⁸⁰ This tragedy offers several lessons on how to avoid casualties from bomb attacks. It illustrated that it is pointless to build barricades to prevent truck bombs from getting into the base if you have people living within a few feet of the perimeter. Putting distance between the perimeter and living quarters is vital, as even large bombs lose their killing force rapidly over distance. Despite the fact that the bomb at Khobar Towers was estimated at between three and eight thousand pounds, a security policeman running

⁷⁹ Downing, Wayne A., *Force Protection Assessment of USCENTCOM AOR and Khobar Towers*, Report of the Downing Assessment Task Force, 30 August 1996, 7.

⁸⁰ Downing, 1.

towards the scene, only 80 feet away at the time of detonation, received only minor injuries from the explosion.⁸¹

Although much was made of the large size of the bomb at Khobar Towers, a much smaller bomb would have killed nearly the same number of people.

A Task Force explosives expert calculated that if a 200 pound bomb had exploded 80 feet from Building 131, severe window frame failure and spalling of reinforced concrete would have resulted...Injuries from glass fragments would have been extensive. Major structural damage would probably have caused the building to be condemned. The Task Force estimated between five and 11 deaths would have occurred from the 200 pound blast. The estimate assumes that people were in approximately the same position as they were on June 25th. Deaths would have resulted from the effects of the flying glass and not from blunt trauma.⁸²

On January 8, 1996, (six months before the blast), a vulnerability assessment of Khobar Towers said: “windows throughout Khobar Towers are untreated and are not protected by any blast mitigation scheme. The blast from a car bomb or other device would shatter windows sending shrapnel into quarters and offices throughout the affected buildings.”⁸³ The assessment recommended installing “4 mil SRWF [Mylar] on all perimeter glass” to make the windows shatter resistant.⁸⁴ This action was not taken and, as a result at least two and possibly as many as 12 of the fatalities, and approximately 90% of the 500 injuries were caused by glass fragmentation.⁸⁵ Making windows shatter resistant is a simple way to protect personnel, and it should not be overlooked.

Finally, Khobar Towers illustrates the importance of having quick reaction procedures in effect for evacuation and protection of troops. Buildings at Khobar Towers were built by the Saudis without fire alarms or emergency lights. The British contingent of the coalition force immediately installed fire alarms and conducted monthly

⁸¹ Dep Sec of Def John P. White, Chairmen of JCS, Gen John Shalikashvili, and Gen Wayne Downing, Former Commander, Special Forces, “Defense Department Special Briefing: Force Protection Issues in Aftermath of Khobar Towers Boming in Saudi Arabia”, Federal News Service, September 16, 1996.

⁸² Downing, 56

⁸³ Ibid

⁸⁴ Ibid

⁸⁵ Ibid, 13

evacuation drills of their buildings.⁸⁶ US forces did not install any alarm system in the buildings and practiced no evacuation drills.⁸⁷ As a result, despite the fact that security police saw the bomb truck and was alerted to the threat at 9:49 PM, (the bomb did not detonate until 9:55 PM), the security police were unable to evacuate the building in time.⁸⁸ Evacuating vulnerable buildings and move personnel to bunkers in a timely manner is essential.

Another significant threat to personnel is sniper attack. The first solution to this threat can be as simple as using privacy fencing around the compound to prevent snipers from seeing into compounds and acquiring targets. The Downing report suggested hardening the sides of transport vehicles used to transport personnel from living areas to the main base. Finally, it will be important to patrol and monitor high ground where a potential sniper can see down into the base.

The last area to be addressed under the topic of ground protection bridges the gap between ground and air defense. Aircraft are most vulnerable to attack when they are low and slow, such as while taking off and landing at their base. Hand-held heatseeking SAMs can be extremely dangerous at this time. It will be necessary to set up patrols to monitor the approach and departure corridors to the base to deny the enemy the chance to get into position for a shot. It will also be necessary to establish procedures for aircraft to remain as high as possible until the last moment during landing approach, and to climb as rapidly as possible during departure so as to spend a minimum of time in the threat envelope of heatseeking missiles and hand held weapons.

Air-to-Air Defense

Protection from the enemy air-to-air threat is the next major area for self defense guidelines. In this day of US air supremacy, it is easy to become complacent about this potential threat. This study has already discussed the potential of a one time mass attack by the enemy to overwhelm our air superiority fighters by sheer numbers and attack our

⁸⁶ Ibid, 60

⁸⁷ During the author's 90 day deployment to Dahran from Dec '93 to Mar '94, *no* evacuation exercises were conducted and no procedures for evacuation were in effect for US personnel.

⁸⁸ Downing, 53

High Value Air Assets. Other threats include a quick attack when they see a window of vulnerability, a deception plan to disguise as coalition aircraft long enough to get into shooting position, and a stand-off attack using Beyond Visual Range (BVR) missiles in a low percentage attempt to get a lucky hit on a high value target.

The first possibility, executing a quick attack during a window of vulnerability, is probably the most likely. Both active and passive detection techniques by the enemy can allow the enemy to analyze patterns and standard operating procedures by coalition aircraft. Always holding an aircraft on alert can allow an enemy to quickly respond to any mistake on the part of the coalition. For example, after months of quiet patrolling, an AWACS aircraft may decide to remain on station when its F-15C escort needs to return to base, even if its replacement is still some distance away. This may be the opportunity the enemy has been waiting for to launch an attack. Complacency must be anticipated and ROE should be developed to prevent these windows of opportunity from occurring.

The next possibility is a deception plan by the enemy to slip in with coalition aircraft to get into range during the confusion to mount a quick hit-and-run attack. Vigilance and careful sorting of airborne assets can prevent this type of attack, but complacency and momentary lapses in monitoring may give the enemy an opportunity. Ensuring that only aircraft with operating Mode IV IFF transponders are allowed to enter the operating area will allow quick sorting and identification of bandits in case confusion develops. All friendly fixed and rotary wing aircraft should be required to operate with Mode IV on at all times as part of the ROE.

Attempts to launch missiles from long range in the hopes of getting a lucky hit can be very difficult to counter. The long range of some missiles forces a quick decision on defenders. The two extremes of the problem with long range attacks were illustrated by the USS Stark and the USS Vincennes. Cautious ROE to avoid accidental shootings and complacency on the part of the crew caused the USS Stark to be unprepared for a mistaken attack by an Iraqi fighter armed with a long range missile during the Iran-Iraq war. The crew did not challenge the Iraqi fighter pilot's intentions soon enough, and the ship was not properly oriented to the threat so defenses could be brought to bear before the two Exocet missiles hit, resulting in the deaths of 37 sailors and severe damage to the

ship.⁸⁹ The Captain and the Tactical Action Officer of the USS Stark were both disciplined for the lack of preparation and prompt response to the threat.⁹⁰ As a result of the attack, the Rules of Engagement were changed to allow engagement of potentially threatening aircraft at longer range. This change in ROE, and the fear of another Stark incident, directly led to the shooting down of an Iranian Airbus by the USS Vincennes.⁹¹ An intelligent adversary may use this potential for confusion to either mimic an airliner until they are within the maximum range of their missiles, or use it in an attempt to get US aircraft to mistakenly fire on an unarmed airliner. Regardless of enemy tactics, ROE must keep our critical assets far enough outside the enemy's maximum range to allow sufficient time for our fighters to sort enemy fighters from airliners.

Surface-to-Air Defense

The third major aspect of self defense to be addressed is the surface-to-air threat. There are three segments to the surface-to-air threat to analyze: Anti-Aircraft Artillery (AAA), Lasers, and Surface to Air Missiles (SAMs). AAA is the most common and the easiest for an unsophisticated enemy to obtain and operate, while the SAM threat is potentially the most deadly and difficult to deal with.

Enemy AAA is extremely mobile, easy to hide, and simple to operate. As a result, almost anyone can use it and friendly intelligence is unable to keep track of its exact location. Fortunately, most of the common, small caliber AAA can be overflown at medium altitude. The larger caliber AAA is difficult to aim and shoot at a maneuvering fighter aircraft, and the slant range is extremely limited. Large AAA, if found, can easily be avoided, and if shot at, a jet can get out of range quickly.

Retaliation against hostile AAA can be very difficult and frustrating. Unless it continues to fire, it can be almost impossible to locate and identify which gun fired. Even if it can be identified it is frequently located in positions that cannot be attacked, such as

⁸⁹ REPORT ON THE STAFF INVESTIGATION INTO THE IRAQI ATTACK ON THE USS STARK, Committee on Armed Services, House of Representatives, One Hundredth Congress, First Session, June 1987, 12-24.

⁹⁰ US NAVY Memorandum For Correspondents, July 27, 1987.

⁹¹ Rogers, Will and Sharon, *Storm Center: The USS Vincennes and Iran Air Flight 655*, Annapolis, Maryland: Naval Institute Press, 1992, pg. 4 "Vivid memories of a blackened hulk [USS Stark] and flag-draped coffins were never far from our minds."

in school yards or on top of hospitals. The best way to counter AAA is to stay at medium to high altitude and avoid known locations. Unless the enemy begins to set up AAA traps that become a real danger to aircraft, it is best to only respond if politically necessary, because seldom will it be militarily necessary.

Lasers are a new threat for pilots to consider. Many lasers, invisible to the naked eye, can cause serious and sometimes permanent injury to a pilot's eyes. For a fighter aircraft, (single seat), this can be as bad as a direct hit from a SAM. A pilot who cannot see, cannot land, and will be forced to bail out. It will be very difficult to assign blame to whoever used the laser because the beam will probably be untraceable. The only real counter to lasers is to obtain an accurate intelligence estimate of the enemy laser capability and to issue laser-resistant visors to aircrew if the danger is high enough.

The most ambiguous threat to develop self defense guidelines for is the threat from Surface to Air Missiles. Before he can develop Rules of Engagement for SAMs, the air planner must completely understand the procedures and tactics used by SAMs to attack aircraft. Once this is understood, thresholds for response and ROE can be specified. This section will not deal with heatseeking SAMs because, like low caliber Anti-Aircraft Artillery, they are easily overflown at medium altitude.

Understanding exactly how radar guided SAMs work is the first step in learning how to defend against them. SAMs use several basic components to achieve a kill, the ground radars, the missile, the seeker head, and the warhead. Each of these components can be defeated with the right tactics.

First, every SAM system needs at least three types of radar to operate. A long-range Early Warning (EW) radar gives the enemy Integrated Air Defense System (IADS) an overall air picture, so targets can be sorted and assigned to the appropriate SAM sites. Sometimes an enemy Ground Control Intercept (GCI) radar, one primarily used for vectoring air-to-air fighters to their targets, can be used in place of the EW radar. Once an air picture is developed, targeting is handed off to the Acquisition radars. Acquisition radars can acquire targets at short range without information from EW radars, but they are far less efficient when operating autonomously. Older acquisition radars need special Height Finder (HF) radars to give them altitude information on the target, but most modern acquisition radars have their own HF capability. The job of the acquisition radar

is to refine the location of the target aircraft and pass this information on to the Target Tracking Radar (TTR). Because it has a very narrow field of view, it is extremely difficult for a TTR to find a target by itself. Aiming a TTR is like trying to find a small object while looking through a straw. Although it is possible, it is time consuming and very difficult. This makes TTRs dependent on the acquisition radar for information. The job of the TTR is to put a strong, focused spot of radar energy onto the target aircraft. This is what the missile will guide on to find and destroy the target. Although each of these radars can conceivably operate on its own, when they work together in concert, they present a formidable air defense system.

The missile itself is made up of a propellant, a guidance system, a warhead, and seeker head. The amount of propellant determines the missile's speed and range, the control surfaces and guidance system determine the maneuverability, and the size of the warhead determines its lethality and kill radius. All of these components require trade offs. The more propellant used, the higher the range and speed, but because of the increased size, it is less maneuverable. Increasing the size of the control surfaces increases maneuverability, but the additional drag they produce limits the missile's speed and range. The larger the explosive warhead, the larger the lethal kill radius, but then the missile must be larger to carry the warhead which results in a corresponding decrease in performance. These trade offs have resulted in a wide variety of missile capabilities, from small, fast, highly maneuverable, short range missiles for attacking fighters, to large, long range, less maneuverable missiles for killing bombers, tankers, AWACS, and other large, not very maneuverable aircraft.

Finally, the type of seeker head has a profound impact on how a missile can be defeated. There are basically four different types of seeker heads. The oldest, and least likely to be encountered is a command guidance system, where the missile receives directional control from the ground radar until intercept. Another relatively rare type of seeker head is the Home On Jam (HOJ) type. This type of seeker locks on to a transmitting source, like the self-protection jammer of an aircraft, and homes in until impact. This type is rare because it is easily defeated by sophisticated jamming packages. The most common type of seeker is the semi-active seeker head. This seeker looks for reflected radar energy and homes in on it. For this type to find a target, a TTR must be

constantly illuminating the target to give the missile something to home in on. If the TTR loses the target, the missile gets lost and misses. The last, and most modern type of seeker is the active seeker head. This type of missile has an active radar in the nose, which tracks the target autonomously. This type is extremely difficult to defeat.

Tactics used by SAMs vary from a very simple, straightforward method of launch as taught by the former Soviet Union, to highly creative deception plans to fool aircraft as to the source of danger. The standard tactic is to build an air picture through the IADS, primarily by EW radars. The targets are then sorted and assigned to each SAM site, where the SAM's acquisition radar locates and tracks it. The acquisition radar feeds the target information to the TTR, which is pointed where the acquisition radar tells it to look. When the target is in tracked and within range, the TTR is turned on and illuminates the target. When the target is illuminated, the missile is fired and it homes in on the reflected energy until the kill. While all this is taking place, the pilot of the target aircraft attempts to counter the missile. First, the pilot's Radar Homing and Warning Receiver (RHAW) gear tells him he is being looked at by the EW radar. Next, he receives indications from the acquisition radar, then a steady warning that the TTR is tracking him. At this point he begins to search for the missile launch, to visually acquire the missile so he can maneuver to defeat it. If he is able to break the lock of the TTR, the missile will miss and he survives.

Unfortunately, most enemies have learned far more sophisticated and devious ways to use these systems to prevent the pilot from realizing that he is targeted until it is too late. Sometimes the enemy launches the missile before turning on the TTR, then at the last moment, he turns it on for the missile to guide on, minimizing the pilot's reaction time. Another tactic is to use an acquisition radar at one location to feed targeting information to a TTR at another location so the pilot will be tricked into looking for the missile in the wrong direction. As a result of all this deception, pilots tend to become very concerned any time they are illuminated by a TTR.

The problems for enforcing a no-fly zone or supporting peace operations in an active SAM environment are obvious. Political constraints to avoid escalation of the crisis will probably prohibit a pre-emptive attack to destroy the SAM sites. This forces a choice for air planners. Should aircraft avoid the SAM threat rings, possibly making it

impossible to carry out the mission effectively, or must pilots operate throughout the theater, without respect to where the threat rings are, and only respond if the enemy initiates a hostile action? Flying regularly through active SAM threat rings requires a careful analysis of the threat and carefully crafted ROE to allow the aircrew to defend themselves when appropriate.

Policymakers must establish solid, understandable guidelines for response, so air planners can develop effective ROE to allow aircrew to operate safely in an active SAM environment. It is obvious that if the enemy fires a missile at an aircraft, a response is required and justified. But what happens if it is only an acquisition radar tracking the aircraft? Is an attack imminent, or is the enemy just trying to provoke a response for propaganda reasons? Is illumination by a TTR to be considered an attack? What if the acquisition radar is located at one site and the missile is launched from another, do you attack the acquisition radar site, the site of the missile launch, or both? Can you attack the acquisition radar if it is also used for controlling civilian airline traffic? Should aircraft respond with lethal force like HARMs or an air strike on sites, or should they be limited to non-lethal responses like jamming? Guidelines and ROE must provide the answers to all of these questions before aircraft can be directed to fly through active SAM threat rings.

As a general rule, the threshold for when to respond with lethal force should be when the reaction time for the pilot is reduced to the point where a normal pilot begins to question his ability to successfully avoid a missile locked on to his aircraft. For most pilots this point is when the TTR begins to illuminate them. ROE, therefore, should define any TTR attempt to illuminate any coalition aircraft as a hostile act which will allow a lethal response. This lethal attack should begin with a HARM engagement of the offending TTR, followed by a planned air strike on any other IADS assets that supported that TTR. Tracking of aircraft by early warning or acquisition radar should only be responded to by non-lethal means, primarily jamming. If political constraints do not allow a lethal response to TTRs, aircraft should not be allowed to fly into the threat rings. Close attention to these ROE for responses to SAM threats in the operating area will most likely be the most crucial decisions to be made for the defense of coalition aircraft.

Guidelines for Defense of Others

The two major areas for the defense of others are the defense of vulnerable aircraft and the defense of ground troops. Some aircraft will need special protection such as UN official flights or visiting VIP flights, and a separate set of ROE will need to be formulated for them. The other category, the defense of ground troops, will represent a considerable escalation of the air campaign, and will require careful consideration of when it will be appropriate.

More than normal caution will be needed when escorting UN and VIP flights. ROE should emphasize a zero tolerance for any radar or anti-aircraft artillery threat while these aircraft are transiting the area. This tighter ROE should also be communicated to the enemy to avoid unnecessary conflict and danger to the special flight. Finally, proper procedures for defensive reactions should be developed for the special flights if a threat appears. Coordinated, pre-planned actions executed quickly may be enough to defeat an attempt by the enemy to shoot down the priority flight.

The ROE for the defense of ground troops will be far more complicated. Close Air Support (CAS) requires close coordination between the ground troops and air support. This will require that detailed instructions and standard operating procedures be worked out to allow a quick response by aircraft without the danger of fratricide. Policy questions about who is authorized to be given CAS and when they can receive it will also need to be decided. Situations that may require CAS include protection of UN convoys and UN positions, International Governmental Organization (IGO) or Private Volunteer Organization (PVO) convoys, and safe havens for refugees.

UN convoys and positions will be relatively easy to support with CAS because most UN forces are equipped and trained to receive and direct CAS, and there is seldom political reluctance to defend UN troops. The main goal when building ROE for these situations will be to obtain authority to release weapons in a timely matter when needed. This can be accomplished by delegation of authority or by rapid, streamlined request channels to the appropriate political level. The problems of command and control suffered by UN troops in Bosnia should be avoided.

Less clear will be what actions will be authorized in defense of IGO and PVO convoys and operations. These groups do not have the proper communications equipment or the expertise to competently request CAS if they are in danger. The air planner should insist that if policy makers want IGO's and PVO's supported, the organizations will have to allow UN troops with communications equipment to accompany them. Otherwise, it is unrealistic to think that air assets can come to their aid.

The defense of safe havens for refugees has been the biggest area of failure in modern air control operations. The failure to take action in Operation Provide Comfort in response to "Saddam's 31 August ['96] offensive with 45,000 troops and 300 tanks into the allied-protected Kurdish self-rule enclave in northern Iraq,"⁹² and the reluctance to come to the aid of the Muslim safe havens in Bosnia in 1995, demonstrated the reluctance of the UN to turn from enforcing a no-fly zone to attacking ground targets, even after pledging support. This political reluctance to shift from air operations to ground support operations will always be a high hurdle to get over and can be expected to cause frustration. Attempting to obtain clear "trigger events" specified for the beginning of ground attacks may help, but air planners should have alternative plans for the protection or withdrawal of ground forces if the political approval for weapons release never comes. Proper surveillance of the ground situation by JSTARS and UAVs will be needed to give planners time to either organize a defense of the safe havens or withdraw troops before it is too late.

Offensive Operations

Offensive air control operations can be anything from enforcing a no-fly to punishing a hostile government or group for failure to comply with sanctions. In all cases, it must be remembered that the goal of air control is to coerce, not necessarily destroy. Political considerations will often need to take precedence over other factors, including some tactical considerations.

⁹² Bruce, James, "Wider No-Fly Zone Turns The Screws On Saddam," Jane's Defense Weekly, 11 Sep 96, pg 5

Enforcing a No-Fly Zone

Careful sorting of aircraft and ROE to prevent fratricide are important aspects of enforcing a no-fly zone. Unless the enforcers are very aggressive in their enforcement, it is very difficult to ensure that minor violations will not occur. Unfortunately, an overly aggressive enforcement of a no-fly zone can easily result in fratricide, as occurred in the shooting down of the two US Blackhawk helicopters over northern Iraq. As noted in Chapter Three, the F-15C pilots were not deliberate enough in the identification of their targets, however, the problems went deeper than that. Training in visual recognition was lacking, the status based ROE was too aggressive for the situation, and the coordination between the Air force and the Army was inadequate.

To correct the first problem, doctrine must emphasize the minimum training standards required for aircrews to be qualified to enforce a no-fly zone. Secretary of the Air Force Sheila Widnall's statement in 1993 that no special training for peace operations is required could not have been further from the truth. Visual recognition training for all configurations of friendly and enemy aircraft in the theater, specific and comprehensive ROE training and testing, and specific scenario training covering ambiguous situations, are the minimum requirements to be set before clearing a crew to enforce a no-fly zone.

The tragedy over northern Iraq highlights a critical aspect of ROE. A value judgment must be made and communicated to the enforcers as to the relative priorities of their mission. When critical assets are threatened, such as the enemy attempting to overwhelm the AWACS fighter screen to destroy a HVAA with a mass attack, it is proper to put the emphasis on shooting down the enemy before he can complete his mission. When the enemy is a pair of slow helicopters which pose no immediate threat to any coalition forces, there is no need to rush to shoot them down. When time is not critical and only a technical violation of the no-fly zone is at stake, ROE must require overwhelming proof before deadly force is authorized. Even if the helicopters were Iraqi Hinds, it would have been politically difficult to justify the loss of life based on a simple violation of a UN sanction, particularly if there were Iraqi civilians on board. "The

helicopters were 30 minutes [inside] the border [of the northern no-fly one]; there was no need to hurry and shoot.”⁹³

Any use of deadly force in the enforcement of a no-fly zone should be the exception, not the rule. Conduct based ROE should be used in all but the most exceptional circumstances, and a periodic review should be required to constantly test whether or not they are still in accordance with the current political objectives and situation. The possible propaganda gains for the enemy far outweigh the benefits of depriving the enemy of a single flight in the no-fly zone. Unless the violations start to take on some military significance, it would be best to wage diplomatic protests and let the case against the enemy build until there is no question about the justification for a shoot down.

It is also imperative that all services and nation members of a coalition operate under the same procedures. There must be open and constant communication between units and a clear understanding that if a unit is going to deviate from the Air Tasking Order, the Airspace Control Order, the ROE, or the Special Instructions, it must either pass that information to all the other units involved, or it must be separated by geography or time. Units cannot operate in the same area, at the same time, under different rules and be unaware of each other if the use of deadly force is authorized.

It was fortunate that the coalition enforcing the no-fly zone over Northern Iraq did not break up over the shutdown of the Blackhawks due to weak training, inappropriate ROE, and lack of coordination between services exhibited by the US Army and Air Force. “A military officer from one of the countries involved in Provide Comfort said ‘this cannot be easily explained away...It wasn’t a friendly fire accident during the heat of battle.’”⁹⁴

Supporting a Blockade

Air control operations to enforce a blockade would likely be limited to surveillance for major violations. Sealing borders against smuggling and small

⁹³ Fulghum, Daid A. and Lenorovitz, Jeffrey M., “Iraq Shootdown May Trigger Legal Action,” Aviation Week and Space Technology, Vol 140, Iss 18, May 2, 1994, 18.

⁹⁴ Ibid, 19

operations would be too costly for the insignificant gains it would offer. The proper use of airpower in enforcing blockades or embargoes is to exploit its speed and mobility to run the surveillance operation and to attack any armed challenges to the enforcement.

Coercing a Hostile Government

Coercion can take two forms: forcing an enemy to do something, and preventing an enemy from doing something. The only way to convince the government to take an action against its wishes is to credibly threaten something it cannot stand to lose. If the price the enemy must pay for noncompliance is considered acceptable to the enemy leader, he will probably not be coerced. As Clausewitz said, “if the decision in war consists of several successive acts, then each of them, seen in context, will provide a gauge for those that follow.”⁹⁵ If the enemy allows himself to be coerced once to avoid some greater punishment, he remains vulnerable to coercion on the next issue that arises where compliance is less painful than the punishment. Eventually, the compliance will cumulate to the point where the leader has given up control over his situation to avoid some limited amount of punishment. Most leaders can see through this process to the end game and realize that, regardless of the current pain/compliance ratio, eventually the pain of repeated compliance will exceed the pain of noncompliance. Therefore, he may as well refuse now if he thinks he can survive. For this reason, if we want to coerce the enemy government, we must threaten something that he cannot afford to lose. The threat must be credible and the enemy must realize that it is credible. Under these guidelines, effective coercion may be possible. The enemy may still decide to “go down with the ship,” but there is the strong probability that he may not.

The key is that any attempt at coercion must threaten something of vital importance to the enemy. It is easy to find militarily significant targets to destroy for military reasons, but it is difficult to find targets that will yield the desired political effect. To determine what the enemy truly cares about, human intelligence is indispensable. The British in Iraq had Captain Glubb to determine what was most important to the Arabs,

⁹⁵ Carl Von Clausewitz, *On War*, ed. And trans. Michael Howard and Peter Paret, (Princeton, NJ: Princeton University Press, 1976), 79.

while UN and NATO coalition forces had extensive contact and intelligence in Bosnia to determine what was important to the Bosnian Serbs. As a result, the British enjoyed considerable success in Iraq, and the UN and NATO coalition had excellent success during Operation Deliberate Force. Whatever targets are chosen, they must be credible, both politically and militarily, and coalition forces must remain prepared for the possibility that an enemy may still refuse to give in. Coercion is a risky undertaking because it may result in the enemy gaining stature if he successfully avoids coercion. The world political perception of the coercion attempt could initiate criticism for the US for abusing a weak country.

Punishment of a Hostile Government

Punishing a hostile government is easier than coercing it because punishment does not depend on the enemy to take any particular action. The most important consideration in a punishment strategy is the choice of targets. The worst case scenario would be to pick a target that is too hard to hit so it survives and the attacker loses aircraft attacking it. If the attacker does not clearly dominate the exchange, the world will question who exactly got punished. Thus, the target chosen should be important to the enemy, militarily and politically vulnerable to attack with minimum risk of misidentification or collateral damage, and if possible, should have some connection to the offense being punished such as an attack against weapons of mass destruction after a WMD attack.

After a credible target is identified for attack, care must be taken in deciding how to attack it. If there is more than a minimal chance that an aircraft may be shot down during the attack, it is probably better to use unmanned assets like cruise missiles, or at least use long range stand-off weapons to minimize the chance of a crew being captured and used for leverage by the enemy. Precision weapons should be used to minimize the chances for collateral damage which would give the enemy a propaganda advantage. The attack should be in unquestionable compliance with the laws of war - a possible problem when attacking WMD facilities. The ROE must be strict with respect to required weather to avoid a gross miss caused by clouds. Finally, consideration must be given to the possibility that the enemy may use human shields at likely targets. He may use POW's

UN observers, or possibly even his own civilians to prevent attack. It may be best to hit a less obvious target to avoid the human shield problem.

This doctrine proposal is by no means exhaustive, there are too many conceivable situations and variables. This doctrine is meant to serve as a framework for evaluating particular situations, then building a concept of operations and ROE for each operation. Hopefully, this doctrine can help to structure a plan that will help to avoid past difficulties while exploiting proven concepts.

Chapter 6

Conclusion and Implications

It is time to finally break the Army paradigm that “you don’t control an area until a soldier is standing on it.”⁹⁶ Air control is not new. For almost 80 years, aircraft have been used to attempt to control the behavior of the population below them. The concept of air control is not revolutionary or an attempt to steal a mission away from the army. It is simply the natural progression of technology attempting to achieve the same goals of control more efficiently. From those first attempts at air control by the British, through the ongoing operations over Iraq and Bosnia, aircraft have never tried to “take over” the job of control to the exclusion of ground troops. Each operation has simply used the tools available to increase their ability to gather information and take rapid action. Airpower has become the most effective tool for performing observation and to taking rapid action, but has in no case given up its dependence on ground support.

Britain in the 1920’s and 1930’s sought a better way to control its many colonies. Money was tight and the British needed a cheaper solution, so Churchill and Trenchard found one in the RAF. At no time, however, did they propose to withdraw all ground troops from an operation. The calculus of cost was centered on how many troops each aircraft could replace, with the recognition that the replacement would never be complete. In Iraq, the proposal was to keep 4,000 British and 10,000 Indian ground troops in the country. This represented a tremendous decrease in the number of ground troops with their associated costs but still left a formidable garrison in place. The British never lost

⁹⁶ Army Field Manual 100-5, “Operations”, June 1993, pg. vi states: “the Army is the

sight of the need for ground troops to protect air bases, gather intelligence, and finalize any agreements face to face with the population.

Modern attempts at air control are less concerned with doing the job cheaper than ground troops in terms of money. They are now more interested in controlling opposition with lower political costs and lower costs in terms of human life. The political cost of flying over another sovereign nation is far less than the political cost of invading with ground troops. Somehow, even when taking offensive action to enforce a no-fly zone, aircraft do not present the same psychological effects to a target nation as a few ground troops occupying some of its territory. Despite seven years of uninterrupted air control operations over northern and southern Iraq, there is still more political pressure to end the small ground occupation in Bosnia than to end the long air occupation of Iraq. Even the UN ground inspection teams looking for evidence of WMD facilities and materials in Iraq have been under more pressure from the Iraqis than the dozens of aircraft that invade their airspace every day.

The modern air control approach also benefits from the fact that fewer personnel are put in harm's way at any given time. Air control operations offer an "economy of life" dividend which make it appealing to political leaders. Most troops who participate in an air control operation never come within range of enemy weapons. The speed and mobility of aircraft allow basing out of reach of conventional enemy weapons, so only a few aircrew members must face the enemy threat each day. In contrast, garrisoning ground troops in a hostile country exposes hundreds of troops daily to the possibilities of sniper attack, ambushes, and shelling. If the situation deteriorates rapidly, aircraft can

only national contingency force capable of achieving land dominance."

evacuate the country they are overflying in minutes, something that is impossible for ground troops.

The weakness of modern air control was starkly illustrated in the Khobar Towers bombing in Dahrhan, Saudi Arabia. If air commanders do not take the terrorist and special operations threats against airbases seriously, the enemy will be able to take advantage of the situation. For years, the terrorist threat was not taken seriously by air commanders. Normally, action was only taken in response to the tragedy. It is time for air commanders to get ahead of the threat and prevent attacks, rather than waiting until after disasters occur.

Finally, understanding the modern electronic threats and the political environments in which they operate is essential for any planner of air control operations. Most situations where air operations are appropriate are politically sensitive. The air planner must be able to articulate to the political leaders the threats posed by modern air defense systems, and recommend politically palatable solutions to those threats. Air planners must then be able to translate the resulting political policies into valid, appropriate ROE which can protect aviators while still achieving political objectives. Limited conflicts that call for air control are becoming more common and more complex. Air planners must develop and refine air control doctrine to stay ahead of this trend, rather than trying to build ad hoc arrangements and “figure it out as we go.”

Bibliography

Primary Sources

- British Air Staff Memorandum No. 46, *Notes On Air Control of Undeveloped Countries*, London: Air Ministry, 1930.
- British Air Staff Memorandum No. 16, *Principles Governing The Use Of Air Power In Iraq*, London: Air Ministry, 1924.
- Letter from Henry Dobbs to Air Marshall Sir John Salmond, 12 Feb 1924.
- British Air Ministry Iraq Command Report, October 1922 – April 1924.
- British Air Ministry Iraq Command Report, April 1924 – November 1926.
- Report On The Staff Investigation Into The Iraqi Attack On The USS Stark, Committee on Armed Services, House of Representatives, One Hundredth Congress, First Session, June 1987.
- Author's personal experience in Provide Comfort and Southern Watch.

Secondary Sources

- August, et al, "Airpower As A Tool of Foreign Policy," Maxwell AFB, AL, ACSC paper, 1993.
- Bash, Brooks L. "The Role of United States Airpower in Peacekeeping," Maxwell AFB, AL: Air University Press, 1994.
- Beale, Michael O., *Bombs Over Bosnia: The Role Of Airpower in Bosnia-Herzegovina*, Air University Press: Maxwell AFB, AL, August 1997.
- Blechman, Barry M. and Kaplan, Stephen S. *Force Without War: U.S. Armed Forces as a Political Instrument*. Washington D.C.: The Brookings Institute. 1978.
- Boutros-Ghali, Boutros. *An Agenda for Peace: Preventive Diplomacy, Peacemaking and Peacekeeping*. New York: United Nations, 31 Jan 1992.
- Brill, Arthur P. Jr., "Anatomy Of An Air Strike," Sea Power, April, 1996.
- Bruce, James, "Wider No-Fly Zone Turns the Screws on Saddam", Jane's Defense Weekly, 11 Sep 96.
- Bullock, Harold E., Maj USAF. *Peace by Committee: Command and Control Issues in Multinational Peace Enforcement Operations*. Maxwell AFB, AL, School of Advanced Airpower Studies: Air University Press. Feb. 1995.
- Canavan, M. B. M. "Peacemaking by Military Intervention," Unpublished paper. Maxwell AFB, Ala: Air Command and Staff College, November 1992.
- Canavan, M. B. M. "The RAF and Air Control to 1939," Dissertation, Montgomery: University of Alabama, July, 1993.
- Casagrande, Ric, Wing Commander, RAAF. *Peace Operations: The Air Force Contribution*. Fairbairn ACT 2600: Air Power Studies Centre. November 1994.

- Cavanaugh, John P., *Operation Provide Comfort: A Model For Future NATO Operations*, Ft Leavenworth, NE, School of Advanced Military Studies, AY 91-92.
- Christman, Lt Cmd C. L. "Should We Be In Bosnia? Operational Considerations For Using Military Force," Newport, RI: Naval War College, 1993.
- Clarke, Walter S. "Background Information for Operation Restore Hope." Carlisle Barracks, Pennsylvania: Department of National Security and Strategy. 1992.
- Clary, David E., "Operation Provide Comfort – A Strategic Analysis", Maxwell: Air War College, Apr '94.
- Clausewitz, Carl von, *On War*, Edited and translated by Michael Howard and Peter Paret. Princeton, NJ: Princeton University Press, 1976.
- Corsini, Roberto, "The Balkan War: What Role For Airpower", Airpower Journal, Winter, 1995
- Corum, James S. "Airpower and Peace Enforcement," A paper presented to the Royal Norwegian Air Force Academy, February 1996.
- Corum, James, S. "Operational Problems in Peacekeeping and Humanitarian Operations," Unpublished paper, Maxwell AFB, AL: School of Advanced Airpower Studies.
- Corum, James S. "Supporting United Nations and Regional Peacekeeping Efforts." in Challenge and Response: Anticipating U.S. Military Security Concerns. Ed Karl P. Magyar. Maxwell AFB, AL: AU Press, Aug 1994.
- Covault, Craig, "NATO Hits Missile Sites; Large Force Bombs Air Base," Aviation Week and Space Technology, November 28, 1994.
- Covault, Craig, "AWACS, Command Chain Key To NATO Shootdown," Aviation Week and Space Technology, March 7, 1994.
- Cowdrey, Christian B., "Shoot? Don't Shoot? Rules Of Engagement in Peacekeeping Operations," Ft Leavenworth, NE, School of Advanced Military Studies, AY 94.
- Cox, Gary, "Air Power as a Tool of Foreign Policy: Air Occupation" War and Conflict Resolution Coursebook, ACSC Maxwell AFB, AL, Jan 1997.
- Damrosch, Lori Fisler, ed. *Enforcing Restraint: Intervention in Internal Conflicts*. New York: Council on Foreign Relations Press, 1993.
- Davis, Lynn E. "Peacekeeping and Peacemaking after the Cold War." Unpublished paper, Santa Monica CA: RAND, 1993.

Defense Department Special Briefing: Force Protection Issues in Aftermath of Khobar

- Towers Bombing in Saudi Arabia", Federal News Service, September 16, 1996.
- Dippold, Marc K., "Air Occupation: Asking The Right Questions," Maxwell AFB, AL, ACSC paper, 1997.
- Downing, Wayne A., "Force Protection Assessment of USCENTCOM AOR and Khobar Towers," Report of the Downing Assessment Task Force, 30 August 1996.
- Eflein, Dawn R., "A Case Study Of Rules Of Engagement In Joint Operations: The Air Force Shootdown Of Army Helicopters In Operation PROVIDE COMFORT," The Air Force Law Review, Spring 1998.
- Fulghum, Daid A. and Lenorovitz, Jeffrey M., "Iraq Shootdown May Trigger Legal Action," Aviation Week and Space Technology, Vol 140, Iss 18, May 2, 1994.
- Fulghum, Daid A., "Clashes With Iraq Continue After Week Of Heavy Air Strikes,"

- Aviation Week and Space Technology, January 25, 1993.
- Fulghum, Daid A., “*Pentagon criticizes Air Strike On Iraq*,” Aviation Week and Space Technology, January 25, 1993.
- Fulghum, Daid A., “*U.S. Crews Strike Serb Positions*,” Aviation Week and Space Technology, April 18, 1994.
- Gallego-Serra, Fermin, “*Heavy Allied Air Activities Maintained Over Bosnia*,” Armed Forces Journal, July 1993.
- George, Alexander L. and William E. Simons. *The Limits of Coercive Diplomacy*. (Boulder: Westview Press, 1994).
- Goshko, John M., “*Rebel Urges West to Aid Iraqi Kurds*,” Washington Post, April 12, 1991.
- Glubb, Sir John Bagot, *War in the Desert, an RAF Frontier Campaign*, (London: Hodder and Staughton, 1960).
- Grunawalt, Richard J., “*the JCS Standing Rules Of Engagement: A Judge Advocate’s Primer*,” The Air Force Law Review, 1997.
- Gunter, Michael M. “*The Kurdish Peacekeeping Operation in Northern Iraq, 1991*,” in *Peacekeeping and the Challenge of Civil Conflict Resolution*. Ed. David A. Charters. University of New Brunswick: Centre for Conflict Studies, 1994.
- Hammond, Grant T. and Len Murin. “*Airpower in Peace Support Operations*.” Draft Unpublished Paper. Maxwell AFB, Ala: Air War College. Feb. 1995.
- Harrington, Daniel F., John R. Dabrowski, Michael D. Dugre, Thomas L. Raab, and Robert Young. *History of Combined Task Force Provide Comfort: 6 April 1991 - 30 June 1992, Vol I and II.(U)* Unpublished Report. Maxwell AFB. AL: USAF Historical Research Agency. (Secret)
- Hines, Jay E., Lt Col Jason D. Mims, USA, and Hans S. Pawlisch. “*USCENTCOM in Somalia: Operations PROVIDE RELIEF and RESTORE HOPE*.” Unpublished monograph, MacDill AFB FL: United States Central Command History Office, November 1994.
- Hudson, Neff, “*Fighter-Bombers, Fired On, Attack Iraqi Site*,” Air Force Times, August 30, 1993.
- Hughes, Barry B, *Continuity and Change in World Politics*, NJ: Simon & Schuster, 1994.
- Jackson, Robert, *The RAF In Action, From Flanders to the Falklands*, (Dorset: Blanford Press, 1985).
- Janssen, Joris, “*‘Deny Flight’ Turns To Affirmative Action*,” Jane’s Defense Weekly, September 9, 1995.
- Lorenz, Frederick M., “*Standing Rules Of Engagement: Rules To Live By*,” Marine Corps Gazette, February, 1996.
- Magas, Branka, “*UNsafe Havens*,” New Statesman & Society, Vol 7, Iss. 332, December 9, 1994.
- Mcallister, J.F.O., “*To Bomb Or Not To Bomb*,” Time, May 10, 1993.
- McLaughlin, Mark C., “*Balkans Air Campaign Study*,” Draft, School Of Advanced Airpower Studies, Maxwell AFB, Al., October 1997, Chapter 8.
- Morrocco, John D., “*Raids Highlight Pitfalls Of Limited Use Of Force*,” Aviation Week and Space Technology, January 25, 1993.
- Omissi, David E., *Air Power and Colonial Control, The Royal Air Force 1919-1939*, (Manchester: Manchester University Press, 1990).

Owen, Robert C., "*Balkans Air Campaign Study*," Draft, School Of Advanced Airpower Studies, Maxwell AFB, AL., October 1997, Summary.

Palmer, Douglas C., "*Rules Of Engagement As An Operational Tool*," Newport, R.I., Naval War College, February, 1993.

Peebles, Curtis, "*Dark Eagles: A History of Top Secret US Aircraft Programs*," (Novato, Ca.: Presidio Press, 1995).

Rogers, Will and Sharon, "*Storm Center: The USS Vincennes and Iran Air Flight 655*," (Annapolis, Maryland: Naval Institute Press, 1992).

Seabury, Paul and Codevilla, Angelo, *War Ends and Means*, NY: Basic Books Inc., 1989.

Sims, Charles, *The Royal Air Force, The First Fifty Years*, (W&J Makay & Co LTD, UK, 1968).

Szilagyi, Andrew D. Jr and Wallace, Marc J. Jr, *Organizational Behavior and Performance*, (US: HarperCollins, 1990).

Tallent, Michael E., "*Air Occupation: An Environmental Impact Study*," Maxwell AFB, AL, ACSC paper, 1997.

Thompson, Butch, "*Factors Influencing Rules Of Engagement, And ROE's Effect On Mission*," Newport, R.I., Naval War College, November, 1995.

US NAVY Memorandum For Correspondents, July 27, 1987.

Uzzell, David R., "*Air-to-Air Force's Doctrine and Training for an Air Occupation*," Maxwell AFB, AL, ACSC paper, 1997.

Winnefield, James A. and Johnson, Dana J., "*Unity Of Control: Joint Air Operations In The Gulf*," Joint Force Quarterly, Summer 1993.

Womack, Stephen M., "*Rules Of Engagement In Multinational Operations*," Marine Corps Gazette, February, 1996.

Yang, John E., "*Bush: U.S., 'Allies Concur On Refugee Zones in Iraq*," The Washington Post, Apr 12, 1991.

Government Publications

AFM 1-1, *Basic Aerospace Doctrine of the United States Air Force*. March, 1992.

AFDD-1, "Air Force Basic Doctrine", September 1997.

AFDD 2-3, "Military Operations Other Than War", 5 October 1996.

HA, *Multiservice Procedures for Humanitarian Assistance Operations*. October, 1994.

FM 100-5, *Army Operations*. June 1993.

FM 100-23, *Army Peace Operations* December 1994.

AU-8, *The Army into the 21'st Century*. February, 1996.

Joint Pub 3-0, *Doctrine for Joint Operations*. February, 1995.

Joint Pub 3-56.1, *Command and Control for Joint Air Operations*. November, 1994.